Metropolitan Nashville and Davidson County

MS4 NPDES Permit No. TNS068047

Annual Report
Year 3 - Permit Cycle 2

November 2006

METRO WATER SERVICES

Pure Nashville ... right as rain.

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICIES

1.0 Contact List

The following table lists the people who contributed to and are responsible for the data collection and/or preparation of the annual report.

Table 1.1 Contact List

Name	Agency	Position	Phone
Billy Lynch	Department of Public Works	Director of Public Works	615-862-8706
Mark Macy	Department of Public Works	Assistant Director - Engineering Division	615-862-8764
David Himes	Department of Public Works	Assistant Director - Operations Division	615-862-8755
Jenna Smith-Sexter	Department of Public Works	Solid Waste Division	615-862-8705
Clayton Hand	Department of Public Works	Engineer, Public Works Solid Waste Division	615-862-8623
Mike Ryman	Department of Public Works	Technician Specialist Public Works Hazardous Materials Spill Response	615-862-8765
Scott Potter	Metro Water Services	Director	615-862-4505
Sonia Harvat	Metro Water Services	Public Information Officer	615-862-4494
Charles Boddie	Metro Water Services	Training Coordinator	615-862-8744
Tom Palko	Metro Water Services	Assistant Director, Stormwater Division	615-862-4510
Danny Smith	Metro Water Services	Head of the Stormwater Division, Plan Review Section	615-862-4799
Ricky Swift	Metro Water Services	Engineer/Manager, Stormwater Remedial Maintenance Division	615-862-4784
Paula Kee	Metro Water Services	Engineer, Stormwater Plan Review Section	615-880-2334
Steve Mishu	Metro Water Services	Engineer, Stormwater Plan Review Section	615-862-4780
Jennifer Knauf	Metro Water Services	Engineer, Stormwater Plan Review Section	615-862-4793
Gong-Yu Hsu	Metro Water Services	Engineer, Stormwater Plan Review Section	615-862-4518
Brian Halford	Metro Water Services	Engineer, Stormwater Plan Review Section	615-862-4582
Angela Foster	Metro Water Services	Engineer, Stormwater Plan Review Section	615-862-4495
Denny Bone	Metro Water Services	Administration Service Manager, Stormwater Maintenance Division	615-862-4537
Michael Hunt	Metro Water Services	System Services Manager, Stormwater NPDES Department	615-880-2420
Bonnye Holt	Metro Water Services	Office Support Representative, Stormwater NPDES Department	615-880-2420
Dale Binder	Metro Water Services	Construction Inspection Manager , Stormwater NPDES Department	615-880-2420
Harold Bryant	Metro Water Services	Construction Site Inspector, Stormwater NPDES Department	615-880-2420
Shawn Herman	Metro Water Services	Construction Site Inspector, Stormwater NPDES Department	615-880-2420
Tim Mathis	Metro Water Services	Construction Site Inspector, Stormwater NPDES Department	615-880-2420
Phil Sadd	Metro Water Services	Construction Site Inspector, Stormwater NPDES Department	615-880-2420
Robert Vaught	Metro Water Services	Construction Site Inspector, Stormwater NPDES Department	615-880-2420
Thomas Mauck	Metro Water Services	Construction Site Inspector, Stormwater NPDES Department	615-880-2420
Steve Winesett	Metro Water Services	Watershed/Water Quality Manager, Stormwater NPDES Department	615-880-2420
Rebecca Dohn	Metro Water Services	Water Quality Inspector, Stormwater NPDES Department	615-880-2420
Kimberly Moore	Metro Water Services	Water Quality Inspector, Stormwater NPDES Department	615-880-2420
Josh Hayes	Metro Water Services	Water Quality Inspector, Stormwater NPDES Department	615-880-2420
Mike Seremet	Metro Water Services	Water Quality Inspector, Stormwater NPDES Department	615-880-2420
Anna Kuoppanmaki	Metro Water Services	GIS Analyst, Stormwater NPDES Department	615-880-2420
Denice Johns	Metro Water Services	GIS Technician, Stormwater NPDES Department	615-880-2420

This Page Intentionally Left Blank

2.0 Stormwater Management Plan (SWMP) Evaluation

2.1 Objective of the Program

The objective of the SWMP is to maintain or improve the quality of Davidson County water resources and "Waters of the State of Tennessee" to the Maximum Extent Practicable (MEP). This leads to an overall goal of achieving water quality improvements in every Davidson County stream reach included on the Tennessee Division of Environment and Conservation's (TDEC) 303(d) impaired streams list, whereby, each stream can be successfully removed from this list. To accomplish this overall goal, several smaller goals were established in the first permit cycle (1996 – 2001) as a basis for developing a variety of stormwater management programs that address specific issues. The following is a list of refined goals established to facilitate ongoing management program improvements and implementation:

A. Emphasize public education, awareness, and reporting as the primary non-structural Best Management Practice (BMP).

B. Minimize construction-related water quality impacts through developer and engineer education, continued improvement of the plans review process, and construction site inspections and monitoring.

C. Minimize long-term water quality impacts through effective, fair, equitable, and feasible site-design requirements and guidance.

D. Implement an effective, fair, equitable, and feasible enforcement program that reduces water quality impacts from accidental and/or intentional discharge of pollutants into the municipal separate storm sewer system (MS4).

E. Gain a greater knowledge of water quality problems within Metro to be used as a decision-making tool in the Capital Improvement Program (CIP).

F. Base programs on current stormwater management theory and practices.

G. Prioritize efforts to solve the worst problems first.

H. Identify problems that can be corrected with reasonable effort and fiscal commitment.

I. Establish and implement the financial, organizational, and legal foundations to support other program goals.

J. Goals, as developed in the permit application process, resulted in the following program elements being used to achieve the objectives of the SWMP:

1. Structural Stormwater Controls and Collection Systems;
2. New Development and Significant Redevelopment;
3. Roadways;
4. Landfills and Other Waste Treatment, Storage, or Disposal Facilities;
5. Pesticides, Herbicides, Fertilizers, Oils, and Other Toxic Materials;
6. Illicit Discharges and Improper Disposal;
7. Industrial and High Risk Runoff;
8. Construction Site Runoff;
9. Habitat Improvement;

10. Monitoring;
11. Public Information and Education (PI&E); and
12. Reporting.

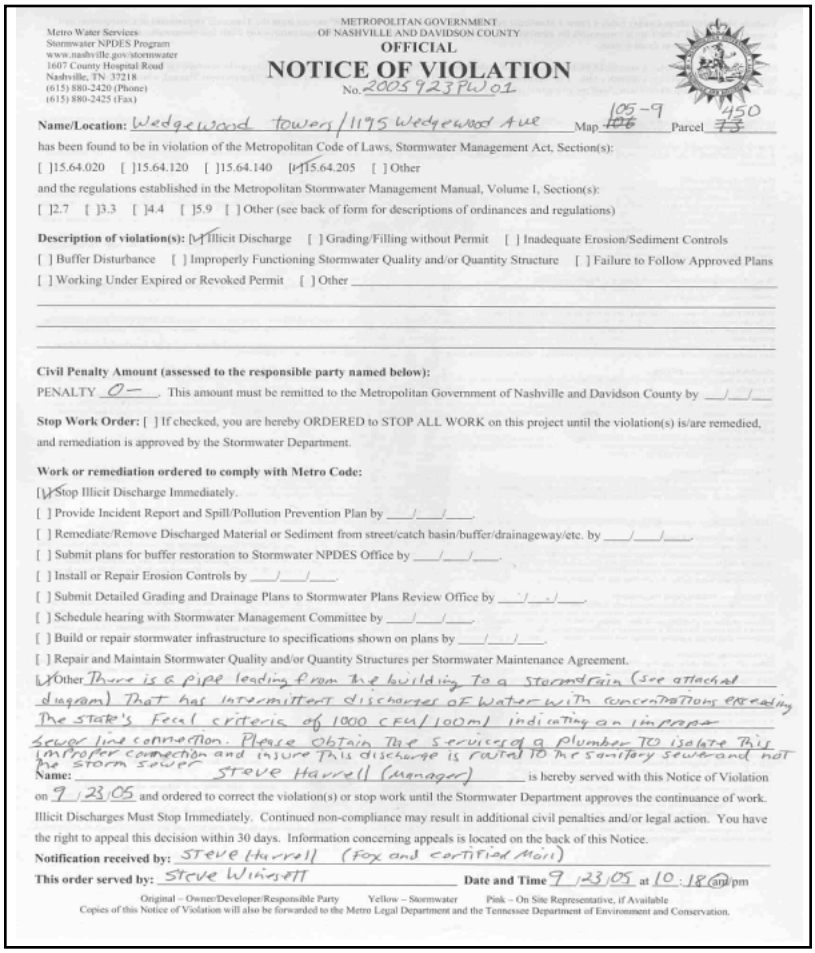
2.2 Major Findings

As MWS has continued to implement the stormwater program, fewer new major impacts to the MS4 have been discovered. However, the following paragraphs describe some of the more notable findings directly impacting water quality of Davidson County streams.

2.2.1 Apartment Complex Sanitary Sewer Disharge

From the thermograph study of previous permit years, elevated bacterial levels were detected in an outfall on Browns Creek. The ensuing investigation led to the discovery of eleven toilets from an apartment complex on Wedgewood Avenue directly plumbed to the parking lot storm drain. The apartment complex was recently sold and the new owners were unaware of the sanitary plumbing issue. An Notice of Violation (NOV) was issued to the site requiring them to re-plumb the toilets to the appropriate sanitary line. The apartment complex completed the required work and NPDES staff is currently monitoring the parking lot catch basin and Browns Creek outfall for bacterial levels.

Figure 2.2.1.1 NOV Issued to the Apartment Complex



Metro Water Services
Stormwater NPDES Program
www.nashville.gov/stormwater
1607 County Hospital Road
Nashville, TN 37218
(615) 880-2420 (Phone)
(615) 880-2425 (Fax)

METROPOLITAN GOVERNMENT
OF NASHVILLE AND DAVIDSON COUNTY

OFFICIAL

NOTICE OF VIOLATION

No. 20059235W01

Name/Location: Wedgewood Towers / 1195 Wedgewood Ave Map 105-9 Parcel 450

has been found to be in violation of the Metropolitan Code of Laws, Stormwater Management Act, Section(s):

[ ]15.64.020 [ ]15.64.120 [ ]15.64.140 [✓]15.64.205 [ ] Other

and the regulations established in the Metropolitan Stormwater Management Manual, Volume I, Section(s):

[ ]2.7 [ ]3.3 [ ]4.4 [ ]5.9 [ ] Other (see back of form for descriptions of ordinances and regulations)

Description of violation(s): [✓] Illicit Discharge [ ] Grading/Filling without Permit [ ] Inadequate Erosion/Sediment Controls
[ ] Buffer Disturbance [ ] Improperly Functioning Stormwater Quality and/or Quantity Structure [ ] Failure to Follow Approved Plans
[ ] Working Under Expired or Revoked Permit [ ] Other

Civil Penalty Amount (assessed to the responsible party named below):

PENALTY 0— This amount must be remitted to the Metropolitan Government of Nashville and Davidson County by ___/___/___

Stop Work Order: [ ] If checked, you are hereby ORDERED to STOP ALL WORK on this project until the violation(s) is/are remedied, and remediation is approved by the Stormwater Department.

Work or remediation ordered to comply with Metro Code:

[✓] Stop Illicit Discharge Immediately.
[ ] Provide Incident Report and Spill/Pollution Prevention Plan by ___/___/___.
[ ] Remediate/Remove Discharged Material or Sediment from street/catch basin/buffer/drainageway/etc. by ___/___/___.
[ ] Submit plans for buffer restoration to Stormwater NPDES Office by ___/___/___.
[ ] Install or Repair Erosion Controls by ___/___/___.
[ ] Submit Detailed Grading and Drainage Plans to Stormwater Plans Review Office by ___/___/___.
[ ] Schedule hearing with Stormwater Management Committee by ___/___/___.
[ ] Build or repair stormwater infrastructure to specifications shown on plans by ___/___/___.
[ ] Repair and Maintain Stormwater Quality and/or Quantity Structures per Stormwater Maintenance Agreement.
[✓] Other There is a pipe leading from the building to a stormdrain (see attached diagram) That has intermittent discharges of water with concentrations exceeding The state's Fecal criteria of 1000 CFU/100ml indicating an improper sewer line connection. Please obtain the services of a plumber to isolate this improper connection and insure this discharge is routed to the sanitary sewer and not the storm sewer

Name: Steve Harrell (Manager) is hereby served with this Notice of Violation on 9/23/05 and ordered to correct the violation(s) or stop work until the Stormwater Department approves the continuance of work. Illicit Discharges Must Stop Immediately. Continued non-compliance may result in additional civil penalties and/or legal action. You have the right to appeal this decision within 30 days. Information concerning appeals is located on the back of this Notice.

Notification received by: Steve Harrell (Fax and certified Mail)

This order served by: Steve Wilmoth **Date and Time** 9/23/05 at 10:18 am/pm

Original – Owner/Developer/Responsible Party Yellow – Stormwater Pink – On Site Representative, if Available
Copies of this Notice of Violation will also be forwarded to the Metro Legal Department and the Tennessee Department of Environment and Conservation.

2.2.2 Industrial Illicit Discharge

While performing an investigation on portions of Richland Creek where issues with industrial site runoff had been reported, the NPDES department noticed an intermittent soapy/chalky colored water flowing from an outfall of a ready mix plant. This discharge was estimated at 5-10 gallons per minute and lasted for approximately 5 minutes. NPDES staff sampled the discharge for several water quality parameters, including pH and Total Suspended Solids (TSS), which exceeded their TDEC permit benchmark values. The NPDES Department issued an NOV and administrative penalty for the illicit discharge. The NPDES Department is currently following up with the site to make sure future illicit discharges do not occur. The NOV and sampling results are included in Attachment A. Photos of the illicit discharge into Richland Creek are included in Figure 2.2.2.1. Results for all of the industrial sampling conducted in permit year 3 are included in Section 4.7 of this document.

Figure 2.2.2.1 Photos of the Industrial Illicit Discharge

2.2.3 Construction Illicit Discharge

While conducting a routine construction site inspection, NPDES staff observed unfiltered pit slurry water discharging directly into Sugartree Creek from a permitted grading site in Green Hills. NPDES staff issued an NOV and administrative penalty ordering them to filter the discharge. In direct response to the NOV, the site installed some filtering devices, however, through follow-up inspections NPDES staff determined the measures were incomplete and a second NOV (and penalty) was issued. Both violations were forwarded to the TDEC Nashville Field Office, which also enforced on the site. NPDES continued to monitor the site until the discolored discharge into Sugartree Creek was eliminated.

Figure 2.2.3.1 Pit Slurry Water

Figure 2.2.3.2 Pit Slurry Water Discharging into Sugartree Creek

2.3 Major Accomplishments

MWS has continued to facilitate major accomplishments during the third permit year of the second permit cycle. These accomplishments include:

1. The NPDES Department has completed the growth and reorganization process to allow better inspection and enforcement for water quality issues. During permit year 3 the NPDES Department was divided into two sections, "construction site compliance" and "water quality compliance". The construction site inspection staff consists of seven individuals that inspect for erosion prevention & sediment control measures and infrastructure installation on all grading permitted sites within Metro's jurisdiction. The construction site inspectors also investigate complaints concerning construction issues of non-permitted sites. The water quality staff consists of five individuals who perform a number of various non-construction water quality investigations, such as industrial inspection, field screening, illicit discharge investigations, watershed management, etc.

2. In the past, MWS has not been staffed to handle inspections and maintenance issues on BMPs. The recent increase in staff levels and reorganization efforts by the NPDES Department has allowed one NPDES inspector to be dedicated to post-construction BMP inspection and enforcement. During permit year 4, this inspector will be able to devote significant time to verifying that post-construction BMPs are being adequately maintained.

3. MWS has continued the process of revising/updating the Stormwater Management Manual to better address ever-changing issues. During permit year 2, numerous meetings were held to receive input from stakeholders' groups and staff from other Metro departments. In permit year 3, the revisions to

the regulations were completed. The revised Stormwater Management Manual is expected to be approved and made effective early in permit year 4. Once the revisions to the manual are approved, the new regulations will reflect technology advances and promote low-impact development practices.

4. During permit year 3, the NPDES Department initiated the "stream walk" program to detect illicit discharges and other potential sources of pollution into Davidson County creeks. The "stream walk" program is the first new program under the watershed management approach, which focuses cross-departmental efforts on improving water quality within stream reaches listed as impaired on the State 303(d) list. The "stream walk" program is discussed in further detail in Section 4.6.5 of this document.

5. The NPDES Department received two national awards for water quality programs initiated in previous permit years. The Environmental Achievement Awards were distributed through the National Association of Clean Water Agencies (NACWA) for the thermography illicit discharge/sanitary seep detection program and the "Toxic Dude" public information and education campaign. These programs are discussed in further detail later in the document.

Figure 2.3.1 NACWA Awards received during Permit Year 3

2.4 Enforcement Documentation

Enforcement documentation is an important component in the SWMP. MWS has a comprehensive enforcement program that includes the issuance of Notices of Violation (NOVs), Stop Work Orders (SWOs), and administrative penalties. MWS also reserves the right to subpoena noncompliant sites to environmental court if NOVs and SWOs fail to bring a site into compliance. Refer to Section 4.2 of this document for a detailed breakdown of documented enforcement statistics since the program's conception.

2.5 Overall Program Strengths

Understanding the strengths and weaknesses of a program is necessary in maintaining a successful SWMP. When strengths and weaknesses are identified, strong points can be featured as the program foundation and weaknesses can be addressed and improved upon each permit year.

One obvious strength of Metro's NPDES Program is the ongoing commitment from the Mayor and MWS officials to meet the requirements of the MS4 permit and improve Metro stormwater resources and waterways for future generations. This is demonstrated by MWS' efforts to make the NPDES program activities known throughout Metro. This continues to result in cross-departmental cooperation in the protection and improvement of stormwater quality. Interdepartmental communication within Metro concerning stormwater issues has increased each year of the NPDES Program's existence.

The commitment from the Mayor and officials of MWS has been further exemplified by the continued support of appropriate staffing levels to oversee development in the Metro area. At the start of permit year 4, staffing levels for the stormwater Plan Review Section totaled 11 individuals, the stormwater NPDES Department totaled 16 individuals, and the stormwater maintenance section totaled 43 individuals.

Despite staffing increases during the last few years, individual workloads have also increased. MWS staff has been working diligently to provide quality service in a timely manner and continued to adopt priorities that ensure the most important stormwater concerns and all permit requirements are being addressed first. In addition, MWS staff has pursued many training opportunities to keep up with growing technological advances. Over the past permit year, MWS staff have attended several training seminars or workshops. Table 2.5.1 presents some of the training sessions that MWS staff have attended.

Table 2.5.1 MWS Staff Training

Training Session Names	Staff Attended	Training Date
HAZWOPER Operation Spill Response	Dale Binder, Mike Seremet, Preston Winesett, Kimberly Moore, Tim Mathis, Shawn Herman, Michael Hunt, Josh Hayes, Rebecca Dohn, Harold Bryant	May 4, 2006
TDEC Sampling Procedures	Rebecca Dohn, Mike Seremet, Josh Hayes, Preston Winesett, Kimberly Moore	May 19, 2006
Downstream Defender Presentation	Angie Foster, Jennifer Knauf	July 26, 2006
Eco-Tech Presentation	Angie Foster, Jennifer Knauf	July 27, 2006
BMP's: Pollutants, Selection & Maintenance (By StormCon)	Angie Foster, Jennifer Knauf	December 2, 2006
Geosynthetics for Roadway Applications (By Tensar)	Angie Foster, Jennifer Knauf	June 22, 2006
TDEC Level 1 Erosion Prevention and Sediment Control	Shawn Herman, Tim Mathis	January 8, 2006
AWRA Conference	Kimberly Moore, Preston Winesett, Josh Hayes, Michael Hunt	April 19-21, 2006
Muddy Water Blues Conference	Kimberly Moore, Michael Hunt	May 11, 2006
NRMCA Concrete Technology Forum	Kimberly Moore	May 24-25, 2006

2.6 Overall Program Weaknesses

As Metro has built its stormwater quality program over the last eight years, a continuous examination of how best to achieve both our permit objectives and community benefits has been a priority. In applying that

consideration to the current state of our program, we would list the following items as areas where we are working toward making improvements:

During the initial formation of the NPDES Department, three wet weather sampling sites were established/approved during the 1997-1998 period. Over time, given the logistics of these sites and the weather patterns in Middle Tennessee, it has proven difficult to consistently collect wet weather samples. In addition, the collected data have not been useful. The NPDES Department believes that a more robust wet weather sampling program can be established to provide more-quality data. During permit year 3, NPDES began discussions with TDEC about modifications to the wet weather sampling requirements. In the start of permit year 4, NPDES received official notice from TDEC that the proposed modifications to the wet weather sampling program were approved. The modifications to the wet weather sampling program will focus on hand-picked outfalls in certain watersheds that, for the most part, only flow during rain events. Modifications to the wet weather sampling program are discussed in further detail in Section 5.1.

The scope of keeping nearly 500 square miles of MS4 infrastructure data up to date is a significant undertaking, especially in an area such as Davidson County that has experienced rapid development over the past few years. In 1999, Metro completed (at significant cost) an initial GIS-based MS4 inventory. Since that time, with the exception of one subsequent update in 2000, projects that served to create changes to the Metro MS4 have been logged and are included in future updating of the MS4 GIS. During the permit year 2, the NPDES Department hired a person solely dedicated to GIS-related responsibilities. After realizing the enormity of the infrastructure updating process, the NPDES Department hired a second individual to work on the MS4 inventory updating process. These personnel have created a MS4 updating process for MWS Stormwater Capital Improvement maintenance projects and private development sites. MWS NPDES has also met with staff from MWS mapping to determine if areas of the CSO are correctly depicted. From the meeting, it was determined that, as a whole the mapped CSO area is correct, but there are several areas around the perimeter of the CSO that would benefit from additional mapping. Since no plans are available for a lot of these areas, the NPDES Department purchased GPS equipment that it began to use to update the MS4 along the CSO perimeter areas. More information on the MS4 infrastructure updating process is available in Section 4.1.1.

Currently, as described in the MS4 permit, Metro is required to inspect industrial facilities classified as: municipal landfills, hazardous waste treatment, storage and disposal facilities, industries under SARA Title III, Section 313, and facilities that MWS determines to be substantial loaders to the MS4. These categories only represent a fraction of the approximate 180 Tennessee Multi-Sector Permitted (TMSP) industrial sites within Davidson County. The NPDES Department has found that many of the SARA Title III, Section 313 sites have non-exposure exemption with virtually no potential for contaminated stormwater runoff, while other sites not within the above-mentioned categories pose a greater threat to discharging contaminated stormwater.

Metro Nashville has over 2000 detention/retention/water quality Best Management Practice (BMP) structures installed across the county and inspection and enforcement of maintenance issues has proven to be difficult. These BMPs are inventoried in a Microsoft Access database, which is updated as projects throughout Metro are completed. During 2004, 100 BMPs which had been installed between 1978 and 2002 were randomly inspected as part of a pilot study and ranked based on required maintenance. Since this pilot study, NPDES has inspected 100 additional BMPS, totaling approximately 10% of all privately owned BMPs and 20% of those owned by Metro. MWS' new BMP inspection program combines information obtained from the pilot study with a watershed based approach to water quality management. The current BMP inspection program concentrates on TMDL watersheds and prioritizes inspections of private BMPs using the data obtained from the pilot study. All Metro owned BMPs will be inspected during C2PY3 and the appropriate agencies will be notified of any deficiencies. After C2PY3, the BMP inspection program will be reevaluated and extended to

303(d) watersheds. As part of the BMP inspection program, NPDES staff will also evaluate any potential retrofit projects.

2.7 Future Direction Of The Program

The MWS NPDES Program continues to define its role in the governmental/regulatory community of Metro Nashville. Several issues have become apparent in the early stages of implementing the MS4 permit. The most apparent of these is that stormwater solutions must be allowed a sufficient amount of time for implementation so that a greater understanding of the system and the associated water quality issues develops within the community.

It is also apparent that improvements in stormwater quality can only come from open and direct communication among the various governmental agencies within Metro Nashville. In an effort to improve communication between governmental agencies, MWS has begun exploring the possibility of establishing "Water Quality Partnerships" with various government agencies, such as the Parks and Public Works.

Metro's current NPDES program direction, as stated in previous annual reports, is to continuously gather information on the state of stormwater quality and trends. This understanding is being generated through various activities including: execution of inspections, investigations (including needed enforcement activities), monitoring, and master planning. This understanding will be further enhanced within Metro by proactive communication among different departments within Metro. Finally, public awareness will come from a robust education program with the goal of encouraging citizens to make a positive impact on the quality of Davidson County's water resources.

As the NPDES Department begins to understand the trends in the various program aspects, it is refining those activities to maximize effectiveness. The NPDES Department refines the program in order to focus and intensify attention to previously unidentified stormwater quality problems and reduce attention to issues that have yielded little, if any, protection or enhancement of stormwater quality.

This Page Intentionally Left Blank

3.0 Summary Table

In the summary tables, the required activities that were accomplished during the permit year are denoted by a bullet (•), while activities not performed during the permit year are denoted by an "X". Those activities not required during a permit year are shown for reference but are shaded ( )

Table 3.1 Summary Act. 1

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
OPERATIONS AND MAINTENANCE OF STRUCTURAL CONTROLS								
1a	Update Stormwater Inventory Geographic Information System (GIS)	Ongoing – by PY 4	•	•	•			
1b	Continue Existing System Maintenance	Ongoing	•	•	•			
1c	Inspections of Dry Creek Detention facility	1 / quarter	•	•	•			
1d	Train Inspection and Maintenance Staff	PY 2 and PY 4		•				
1e	Review Maintenance Procedures	PY 2 and PY 4		•				
1f	Housekeeping Programs	Ongoing	•	•	•			
1g	Stormwater Detention/Retention Facilities	PY 2		•				

Table 3.2 Summary Act. 2

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
CONTROL OF DISCHARGES FROM AREAS OF NEW DEVELOPMENT AND SIGNIFICANT REDEVELOPMENT								
2a	Ordinances, Regulations, and Guidance	----						
	Enforce Existing Ordinances and Regulations intended to limit long-term water quality impacts	Ongoing	●	●	●			
	Evaluate and Update Guidance Materials	PY 2 and PY 5		●				
	Public Education	Ongoing	●	●	●			
2b	Report BMP Monitoring and Considerations	Annually	●	●	●			
2c	Master Planning	----		●				
	Report water quality issues to Planning Commission	PY 2		●				
	Report water quality evaluations performed as part of new water quantity master planning efforts	PY 2 and PY 5		●				
	Report regional water quality practices evaluations performed in any master planning activities	PY 2 and PY 5		●				
	Report watershed prioritization changes	PY 2 and PY 5		●				
	Report master planning performed per prioritized watersheds	PY 2 and PY 5		●				
2d	Training	Annually	●	●	●			

Table 3.3 Summary Act. 3

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
ROADWAYS								
3a	Catch Basin Cleaning	----						
	Prioritize	PY 1	●					
	Report and record	Annually	●	●	●			
3b	Downtown Street Sweeping	Ongoing	●	●	●			
3c	Deicing Practices – Evaluate and Report	PY 1 and PY 3	●		●			
3d	Evaluate Herbicides, Pesticides, and Fertilizers application and storage practices	PY 1 and PY 3	●		●			
3e	Report on Spill Response Program	Annually	●	●	●			
3f	Report Modifications to Design and Construction	Each Compliance Report	●	●	●			

Table 3.4 Summary Act. 4

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
LANDFILLS AND OTHER WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES								
4a	Monitor Activities, Report on Issues	Ongoing	●	●	●			

Table 3.5 Summary Act. 5

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
PESTICIDES, HERBICIDES, AND FERTILIZERS								
5a	Operate Household Hazardous Waste Facility	At least 1/quarter	●	●	●			
5b	Commercial Distributors – Public Information	Ongoing	**X**	●	●			This permit element has been modified to focus on "applicators" vs. "distributors"
5c	Evaluate Metro Facilities Practices	PY 2		●				

Table 3.6 Summary Act. 6

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
ILLICIT DISCHARGES AND IMPROPER DISPOSAL								
6a	Refine Ordinances and Enforcement Measures	PY 1 and PY 3	●		●			
6b	Update and Prioritize Dry-Weather Field Screening	PY 5			●			
6c	Illicit Discharge Investigations	Ongoing	●	●	●			
6d	Distribute Public Information to Residential/Commercial Areas	Ongoing	●	●	●			
6e	Evaluate Reporting for Sanitary Sewer Seepage	PY 1 and PY 3	●		●			

Table 3.7 Summary Act. 7

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
INDUSTRIAL AND HIGH RISK RUNOFF								
7a	Data Management – Update Industrial Site Databases	Annually	●	●	●			
7b	Inspections	---						
	Refine procedures/criteria to prioritize sites	PY 1, PY 3, and PY 5	●		●			
	Train Inspectors	PY 2 and PY 4		●				
	Inspect Facilities	Once by PY 5	●	●	●			Ongoing
	Coordinate inspection and enforcement activities with TDEC staff	Ongoing	●	●	●			
	Report Inspection Locations	Ongoing	●	●	●			
7c	Restaurant Impacts – Report activities that reduce water quality impacts	Annually	●	●	●			

Table 3.8 Summary Act. 8

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
CONSTRUCTION SITE RUNOFF								
8a	Ordinances, Regulations, and Guidance	---						
	Enforce existing ordinances and regulations	Ongoing	●	●	●			
	Refine procedures to enhance enforcement	PY 1 and PY 3	●		●			
	Evaluate and Update guidance materials	PY 1 and PY 3	●		●			
	Public Education	Ongoing	●	●	●			
	Require proof of coverage under the state's construction general permit	Ongoing	●	●	●			
8b	Train Plans Reviewers and Inspectors	Annually	●	●	●			
8c	Records Management - EP&SC inspections	Ongoing	●	●	●			
8d	Plan Review and Inspection Resources	Ongoing	●	●	●			
8e	Evaluate Metro Activities	PY 2		●				

Table 3.9 Summary Act. 9

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
STREAM HABITAT IMPROVEMENT REPORT								
9a	Report habitat improvement activities/projects	Annually	•	•	•			

Table 3.10 Summary Act 10

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
PUBLIC INFORMATION AND EDUCATION (PI&E)								
10a	Inform Public – General Housekeeping Procedures	Ongoing – at least one activity per year	●	●	●			
	Inform Home Owner Associations – Detention Pond Maintenance	Ongoing – at least one activity per year	●	●	●			
	Educate Engineering and Development Community – Long Term WQ Impacts	Ongoing – at least one activity per year	●	●	●			
	Inform Public – Pesticides, Herbicides, and Fertilizers	Ongoing – at least one activity per year	●	●	●			
	Inform Public – Oils and Hazardous Chemicals	Ongoing – at least one activity per year	●	●	●			
	Inform Public – Illicit Connections / Discharges	Ongoing – at least one activity per year	●	●	●			
	Educate Engineering and Development Community – Construction WQ Impacts	Ongoing – at least one activity per year	●	●	●			
	Other Not Yet Identified Opportunities	Ongoing – at least one activity per year	●	●	●			
10b	World Wide Web Site	----						
	Enhance Stormwater Website[1]	Ongoing	●	●	●			
	Provide Reporting Mechanism	Ongoing	●	●	●			
	Establish an Area Dedicated to Recognition	PY 4						

[1] Note that since the Cycle 2 permit was issued, The entire Stormwater Division, including the NPDES Department has relocated to Metro Water Services from Metro Public Works.

Table 3.11 Summary Act 11.

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
REPORTING REQUIREMENTS								
11a	Compliance Report	End of each PY (+ 6 months)	•	•	•			Annually
11b	Propose Third Permit Cycle Activities	End of PY 4 (+ 6 months)						

Table 3.12 Monitoring Summary Act

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
MONITORING								
A	Ambient – 8 or more in-stream locations Sample each site at least 6 times annually	6X Annually (Bi-monthly)	●	●	●			Ongoing
B	Wet Weather – 3 or more in-stream locations Sample each site at least 2 times annually	2X Annually	X	●	X			Unable to obtain samples due to unusual weather patterns, etc.
C	Industrial – Sampling based on inspections	As needed	●	●	●			2 sites sampled
D	Bioassessment – Perform RPB III at 2 designated sites Perform RPB III at 1 or more reference sites	Annually	●	●	●			Ongoing
D	Bioassessment – Refine Procedures	PY 1	●					Ongoing
D	Bioassessment – Perform "quick assessments" as necessary	Annually	●	●	●			
E	Loadings Estimate – Report EMC changes	PY 5						Ongoing
E	Loadings Estimate – Report annual volume and loading changes	Complete by end of PY 3						

This Page Intentionally Left Blank

4.0 Narrative Report

This section of the annual report presents a discussion of the items depicted in the aforementioned Summary Tables, including descriptions of studies, analyses, and investigations performed. In addition, similar activities that are difficult to quantify in the summary table are described in this section. The narrative report is subdivided according to the eleven program elements of the permit as listed in Permit Part III B. For each program element, this section includes a discussion of each objective, activities in permit year three, and a discussion of future direction activities that the MWS NPDES Department proposes for the full permit cycle.

An abbreviated summary table is presented prior to the activity narrative to facilitate review. Unless otherwise noted, June 30, 2006 will be used as a "cutoff date" or "to date" in reporting quantity-based SWMP progress. In the summary table, the required activities that were accomplished during the permit year are denoted by a bullet (•), while those not completed are denoted by an "X". Those activities not required during a permit year are shown for reference but are shaded ( ).

4.1 Operation and Maintenance of Structural Controls (Part III.B.1)

The objective of this program element is to maintain an understanding of the collection system and its performance as a basis for maintenance activities that are intended to benefit stormwater quality. This program element focuses on optimizing the water quality benefits generated through the proper operation, inspection, and maintenance of the existing storm drainage system under the public domain. The proposed program element activity only pertains to stormwater infrastructure that directly and significantly impacts public infrastructure.

4.1.1 Update Stormwater Infrastructure Inventory GIS (Part III.B.1.a.)

Contact Name: Michael Hunt, Stormwater NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1a	Update Stormwater Inventory Geographic Information System (GIS)	Ongoing – by PY 4	•	•	•			

The object of this activity is to maintain the stormwater GIS system developed in the first cycle of the permit. The GIS system will be updated to show areas of new development, significant redevelopment, CSO separated areas, and Metro drainage construction/modification activities performed since the initial infrastructure inventory.

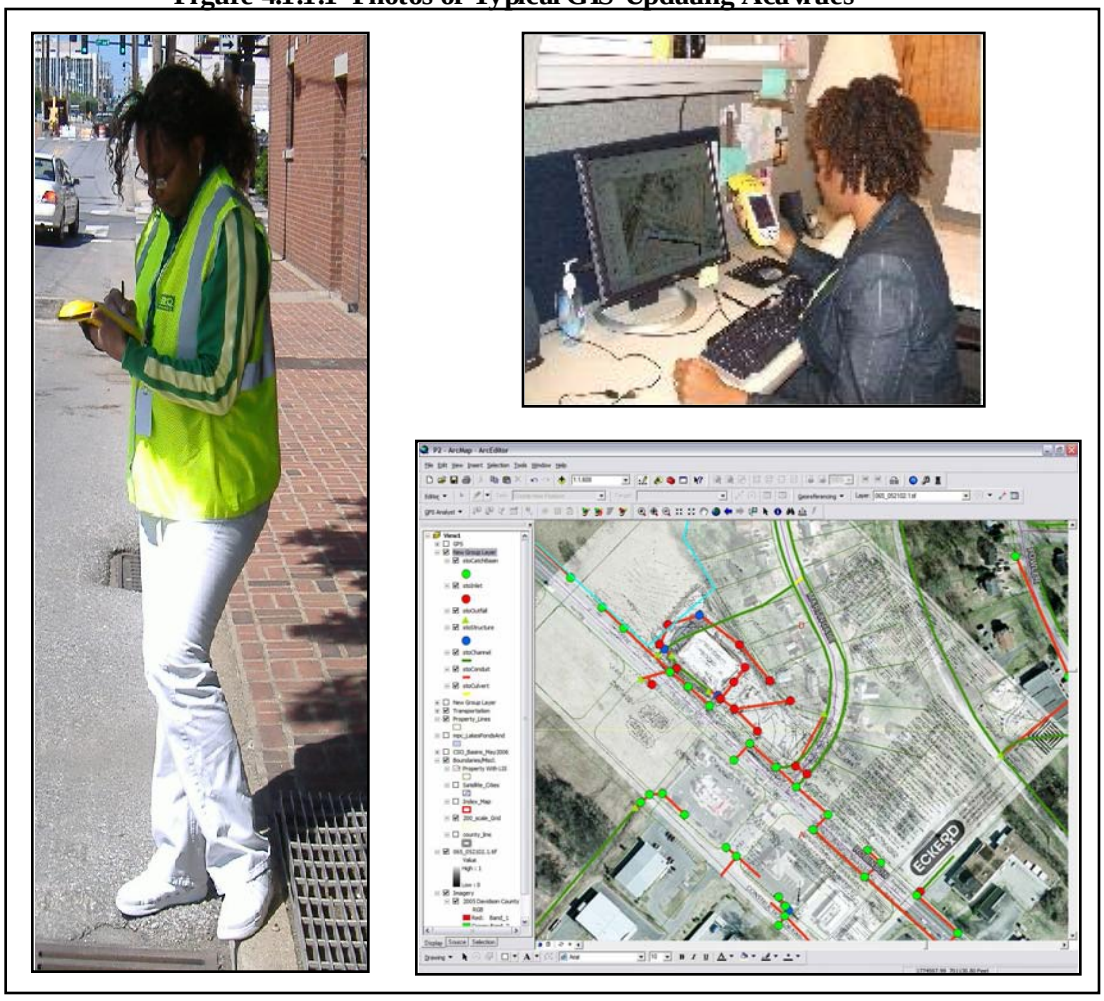
At the end of permit year 1, a full-time GIS employee was hired to, among other things, perform the necessary MS4 updates. During permit year 2, the NPDES Department worked with consultants and internal staff to create a process by which the MS4 updates would occur. From this coordination, processes have been created to update the MS4 infrastructure to show Metro drainage improvements/modifications, areas of new development and significant redevelopment, and CSO separated areas. In permit year 3, the NPDES Department realized the enormity of the updating process and, in response, hired a second individual dedicated to bringing the stormwater infrastructure up to date. An aggressive approach was taken in permit year 3 to bring the backlog of projects up to date in the GIS database.

The updates performed by the NPDES Department are performed either using one or two methods. First, NPDES staff attempts to obtain any available engineered plans that can be scanned in, geo-referenced, and digitized into GIS. Using engineered plans to update the GIS database has proven to be more efficient as the plans typically depict the much-needed attribute data such as pipe size, type, and elevation. If plans are not

available for areas that need to be updated (i.e. CSO fringe areas), the NPDES Department then proceeds with the second option for updating by taking a Global Positioning System (GPS) unit to collect the locations of pipes, inlets, outfalls, etc. During permit year 3, the NPDES Department purchased a GPS unit that has the capability of achieving sub-meter accuracy. This unit is used to collect the infrastructure location and the attribute data is collected in the field and entered into the GPS which transfers to GIS in the download.

As mentioned before, Metro has been aggressively updating the MS4 infrastructure for approximately six years of backlog. At the current pace, Metro expects to have the backlog of updates completed by the end of permit year 4. From that point and beyond, Metro will continue the updating process so as a large backlog does not occur in the future. Given the processes involved in performing updates to the MS4 infrastructure, Metro proposes that after the end of permit year 4, the GIS database, at any given time, will be considered to be up to date if infrastructure changes are entered into the system within 6 months of each respective permit year (i.e. all MS4 modifying projects finished/archived though 7/1/07 will be entered into the system y 1/01/08).

Figure 4.1.1.1 Photos of Typical GIS Updating Activities



4.1.2 Existing System Maintenance (Part III.B.1.b.)
Contact Name: Denny Bone, MWS Maintenance Section, 615.862.4537

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1b	Continue Existing System Maintenance	Ongoing	•	•	•			

MWS stormwater maintenance section continued to maintain the existing public stormwater drainage infrastructure during permit year 3. Maintenance activities were performed on public infrastructure and on private infrastructure that directly impacted public infrastructure. The determination of maintenance service on private infrastructure was made on a case-by-case basis with potential projects identified through customer complaints and otherwise noted through MWS and/or NPDES MS4 permit-related activities.

The MWS stormwater routine maintenance division currently employs eight maintenance crews who perform all of the work on the smaller, routine maintenance projects. The crews are assigned to large ditch maintenance, stormwater inlet construction, stormwater inlet cleanout, and stormwater masonry work. Routine maintenance work completed during most of the third permit year is presented in Table 4.1.2.1.

During permit year 3, MWS continued to utilize the services of the consultant, AMEC, to investigate citizen complaints and analyze, design, and oversee larger construction projects (Remedial and Capital Improvement Projects). Toward the end of permit year 3, MWS scaled back the contract with AMEC and hired personnel to handle the larger maintenance projects internally. In permit year 3, there were 268 service request investigations completed. Of the 268 investigations, 40 became actual projects that will be designed and constructed (depending on funding), 119 were left open for the possibility of becoming projects in the future, and 109 were closed for one of the following various reasons::

- Not a stormwater issue;
- Not an issue of functionality;
- Not a government responsibility;
- A problem that no longer exists;
- Referred to another agency; or
- Referred to major capital improvement projects

In addition, during permit year 3, approximately 51 projects were completed through design and/or construction. Many of these projects were investigated in previous permit years. The complaints that have not been resolved or closed remain open, awaiting review by an engineer for status determination based upon a pre-determined priority matrix.

Table 4.1.2.1 Existing System Routine Maintenance Activity Summary

		Total	FY2002	FY2003	FY2004	FY2005	FY2006
Ditch Maint.	Routine	639	137	352	84	66	14
	Complaint	1,134	0	203	557	374	403
	Class C	40	0	0	1	39	18
		1,813	***137***	***555***	***642***	***479***	***435***
Walls & HW	Routine	125	22	75	17	11	1
	Complaint	417	0	45	211	161	183
	Class C	0	0	0	0	0	1
		542	***22***	***120***	***228***	***172***	***185***
DW Pipes	Routine	420	151	115	106	48	5
	Complaint	667	0	139	249	279	286
	Class C	0	0	0	0	0	0
		1,087	***151***	***254***	***355***	***327***	***291***
Cross Drains	Routine	355	85	118	74	78	66
	Complaint	329	0	80	135	114	171
	Class C	10	0	0	0	10	8
		694	***85***	***198***	***209***	***202***	***245***
Flooding	Routine	73	14	45	4	10	4
	Complaint	31	0	2	14	15	1
	Class C	2	0	0	0	2	2
		106	***14***	***47***	***18***	***27***	***7***
Debris Removal	Routine	150	39	59	26	26	23
	Complaint	101	0	44	29	28	41
	Class C	2	0	0	1	1	0
		253	***39***	***103***	***56***	***55***	***64***
Erosion	Routine	4	0	1	2	1	1
	Complaint	13	0	0	7	6	1
	Class C	1	0	0	0	1	0
		18	***0***	***1***	***9***	***8***	***2***
Mud Removal	Routine	22	4	3	8	7	51
	Complaint	11	0	0	3	8	71
	Class C	0	0	0	0	0	0
		33	***4***	***3***	***11***	***15***	***122***
Misc	Routine	1,441	35	420	590	396	219
	Complaint	264	0	94	95	75	86
	Class C	3	0	0	0	3	1
		1,708	***35***	***514***	***685***	***474***	***306***
Inlet Maint.	Routine	78,246	177	7,278	33,495	37,296	35,258
	Complaint	1,029	0	260	416	353	263
	Class C	5	0	0	0	5	0
		79,280	***177***	***7,538***	***33,911***	***37,654***	***35,521***
		Total	**FY2002**	**FY2003**	**FY2004**	**FY2005**	**FY2006**
	Routine	81,475	664	8,466	34,406	37,939	35,642
	Complaint	3,996	0	867	1,716	1,413	1,506
	Class C	63	0	0	2	61	30
		85,534	**664**	**9,333**	**36,124**	**39,413**	**37,178**

Figure 4.1.2.1 Typical Complaint Investigation Photograph

4.1.3 Inspections of Dry Creek Detention Facility (Part III.B.1.c.)
Contact Name: Denny Bone, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1c	Inspections of Dry Creek Detention Facility	1 / quarter	●	●	●			

The NPDES Department transferred responsibilities in permit year 2 for inspection and necessary maintenance to the MWS Stormwater Maintenance Department. The inspections were performed by the Maintenance Department, however, due to a misunderstanding, the inspections performed during the period October 2004 through December 2005 were not documented. This problem has since been corrected and the maintenance crews are currently inspecting and documenting the Dry Creek detention facility more frequently than once per quarter. Figure 4.1.4 is a typical photograph of the debris that routinely accumulates on the outfall structure of the Dry Creek Reservoir.

Figure 4.1.3.1 Typical Maintenance Need at Dry Creek Reservoir

4.1.4 Training (Part III.B.1.d.)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1d	Staff Training	PY 2 and 4		•				

Metro recognizes that periodic training is critical to the success of the water quality program. During permit year 2, MWS, NPDES office began a rigorous training program for key inspection and maintenance staff from MWS and other Metro departments. The training was intended to educate staff on proper maintenance activities that avoid impacts to water quality and how to recognize and report an illicit discharge when observed in the field. During permit year 4 the NPDES Department will conduct additional training sessions on such staff as Codes Department inspectors and Public Works Maintenance Crews.

4.1.5 Maintenance Procedures (Part III.B.1.e.)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1e	Maintenance Procedures	PY 2 and 4		•				

The NPDES office has reviewed many of the maintenance procedures of different departments and have conducted trainings, mentioned in Section 4.1.4, that were designed to educate maintenance staff on avoiding water quality impacts. NPDES office has been providing oversight and insight to the Stormwater Maintenance Department on such things as the appropriate State and Federal permits needed and proper Erosion Prevention and Sediment Control (EPSC) measures to implement on maintenance jobs. Figure 4.1.5.1 depicts the vast inventory of erosion control matting stormwater maintenance staff have obtained for use on maintenance jobs. In permit year 4, the NPDES Department will begin a new stormwater compliance inspection program for all Metro facilities (i.e. golf courses, parks, fleet maintenance, etc.). In performing the stormwater compliance inspections, the NPDES Department will not only look at how Metro properties are managed for stormwater, but also how maintenance practices are performed in regards to water quality. Figure 4.1.5.1 depicts the vast inventory of erosion control matting stormwater maintenance staff have obtained for use on maintenance jobs.

Figure 4.1.5.1 Stormwater Maintenance Typical Erosion Control Matting Inventory

4.1.6 Housekeeping Programs (Part III.B.1.f.)

Contact Name: Jenna Smith-Sexter, Public Works Waste Management Division 615.862.8727

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1f	Housekeeping Programs	Ongoing	•	•	•			

The Metro Public Works, Division of Waste Management (DWM) provides trash collection service to all residents in the Urban Service District (USD), all businesses in the USD and the Downtown Business District (DBD), and all apartments, public housing, and Metro government buildings within the USD. Monthly trash collection statistics for permit year 3 are presented in Table 4.1.6.1. The table represents DWM trash collection, contracted residential trash collection, and convenience center trash collection.

In an effort to promote waste reduction among residents and businesses within Davidson County, DWM provides several opportunities for recycling. Metro has a curbside recycling program as well as several drop-off locations. During permit year 3, Metro opened a third convenience center at 1019 Omohundro Place and temporarily shut down the center at 939 Anderson Lane for renovations. In addition to the convenience centers, there are eight recycling drop-off centers located throughout the county:

- Bellevue MTA Park & Ride - Coley Davis Road & Highway 70 South
- Elysian Fields Kroger – 3955 Nolensville Road (9 AM ~ Noon Saturday ONLY)
- Hermitage Hobby Lobby – 4101 Lebanon Road
- Hillsboro High School – 3812 Hillsboro Pike
- Charlotte Center Strike & Spare – 3710 Annex Ave (corner of Charlotte Pike & Hillwood Blvd)
- Granbery Elementary School – 5501 Hill Road (9 AM ~ Noon Saturday ONLY)
- Joelton Middle School – 3500 Old Clarksville Highway
- Rivergate Recycling – 630 Myatt Drive

In permit year 3, Metro collected approximately 59,642.03 tons of various recyclable materials that include metal, glass, plastic, oil, cardboard, mixed paper, and brush. Brush collection is provided by Metro Public Works as a curbside service. A route system is utilized to collect brush in the USD and General Services District. Residents of either area will have brush collected automatically at certain times every year. A collection map is available for residents to determine the dates of brush collection. Brush collection statistics are presented in Table 4.1.6.2.

The Household Hazardous Waste Center, discussed further in Section 4.5.1, allows residents to drop-off recyclable goods as well as refuse. The statistics of the waste and recyclables received are presented in Table 4.1.6.3. Metro Public Works/Metro Beautification and Environment Commission also run educational slides on Channel 3, the local government TV channel. These educational slides include:

- Information and logistics for Trash Cart utilization;
- How to properly use the trash cart and the curb-side recycling;
- Metro Convenience Centers and Drop-off sites; and
- Household Hazard Waste.

In addition, during the last permit year, the DWM opened a recycling education room at the Rivergate Recycling Center, where children and adults can learn first hand how recycling works. Also, in an effort to increase awareness and education, Metro Beautification recently targeted twenty-four (24) elementary schools and created a recycling education program suitable for 3rd grade. This education initiative has reached over 2220 students. The DWM also performs numerous other educational activities such as mail outs, etc.

Table 4.1.6.1 Monthly Trash Collection Statistics

Program Type	Tons of Waste Collected												
	July	*August*	*September*	*October*	*November*	*December*	*January*	*February*	*March*	*April*	*May*	*June*	*Grand Total*
Dumpsters	2,370.75	2,600.02	2,421.22	1,998.14	2,407.97	2,245.88	2,341.22	2,011.40	2,445.14	2,157.81	2,519.57	2,373.78	**27,892.90**
Rear Loader Residential	1,243.55	1,311.37	1,554.15	1,193.24	1,363.81	1,312.83	1,383.07	1,067.88	1,223.29	1,101.97	1,231.18	1,245.09	**15,231.43**
Alley/Bulk Items	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.22	379.86	309.98	342.44	256.11	**1,382.61**
Downtown Trash	242.87	252.09	254.62	280.07	244.00	231.44	263.99	242.65	292.32	255.89	266.89	285.23	**3,112.06**
Bordeaux Trash	9.43	7.10	25.64	0.00	14.66	2.33	30.07	6.02	18.49	24.04	32.20	35.30	**205.28**
Cement Plant Road	35.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**35.14**
Club Apartments	18.79	13.08	22.01	16.64	16.34	23.07	20.00	13.22	22.32	17.26	17.41	25.73	**225.87**
Metro Water Services	0.00	0.00	7.70	0.00	8.81	0.00	0.00	19.72	2.03	3.24	8.63	2.25	**52.38**
Rivergate Recycling Trash	21.71	70.85	42.47	19.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**154.58**
Total Metro Public Works Trash Collection	**3,942.24**	**4,254.51**	**4,327.81**	**3,507.64**	**4,055.59**	**3,815.55**	**4,038.35**	**3,455.11**	**4,383.45**	**3,870.19**	**4,418.32**	**4,223.49**	**48,292.25**
Contracted Residential	**7,384.75**	**7,615.60**	**7,726.28**	**6,442.26**	**7,663.49**	**7,620.25**	**7,292.70**	**6,249.75**	**7,927.22**	**7,480.43**	**8,237.20**	**8,294.04**	**89,933.97**
	Convenience Center Trash												
Anderson Lane	263.32	185.14	225.67	203.30	212.30	209.72	11.34	0.00	0.00	0.00	10.87	14.96	**1,336.62**
East Center	797.89	874.91	833.32	845.08	682.61	689.84	939.88	793.11	1,106.62	1,094.31	1,122.65	1,193.01	**10,973.23**
Omohundro	0.00	0.00	0.00	0.00	0.00	0.00	29.57	42.05	33.98	38.98	44.07	51.36	**240.01**
Paint & Paint Thinners	0.00	25.51	18.45	0.00	28.83	0.00	30.03	25.49	17.37	4.07	23.03	23.68	**196.46**
Total Convenenience Center Trash	**1,061.21**	**1,085.56**	**1,077.44**	**1,048.38**	**923.74**	**899.56**	**1,010.82**	**860.65**	**1,157.97**	**1,137.36**	**1,200.62**	**1,283.01**	**12,746.32**
Trash Total:	**12,388.20**	**12,955.67**	**13,131.53**	**10,998.28**	**12,642.82**	**12,335.36**	**12,341.87**	**10,565.51**	**13,468.64**	**12,487.98**	**13,856.14**	**13,800.54**	**150,972.54**

Table 4.1.6.2 Recycling Statistics in Tons

Program Type	Tons of Recycled Waste Collected												
	July	*August*	*September*	*October*	*November*	*December*	*January*	*February*	*March*	*April*	*May*	*June*	*Grand Total*
Curbside Recycling	1,096.92	1,057.16	1128.49	1103.61	1011.88	1235.71	1,190.67	987.55	967.93	1,178.91	998.38	1,104.59	**13,061.80**
Metro Drop Off Facilities													
Bellevue Park and Ride	96.36	110.00	108.45	102.42	119.55	121.04	123.42	94.09	101.52	106.15	115.68	97.25	**1,295.93**
Charlotte Pk.	33.96	35.61	37.95	34.73	52.29	40.36	49.87	34.39	38.29	39.37	42.74	44.14	**483.70**
Elysian Fields	16.37	18.39	17.93	14.41	16.78	21.25	18.70	18.15	28.63	22.44	26.55	22.52	**242.12**
Granberry -- Saturday Only	17.31	14.49	14.92	19.08	16.31	21.08	17.73	13.40	15.84	18.93	16.37	15.25	**200.71**
Hermitage	86.27	79.54	77.75	89.47	87.68	91.12	89.09	75.33	79.92	85.43	83.66	86.32	**1,011.58**
Hillsboro High School	144.22	151.34	133.61	135.52	134.61	162.46	155.84	121.80	139.09	125.47	161.49	157.01	**1,722.46**
Joelton Middle School	13.67	18.80	14.50	14.82	19.39	15.96	16.20	13.33	20.88	17.49	23.05	18.43	**206.52**
Rivergate Recycling	39.02	35.95	30.79	34.32	35.35	34.34	17.71	0.00	0.00	0.00	0.00	0.00	**227.48**
Anderson Lane – Recyclables	5.55	5.15	4.31	3.84	4.76	4.32	28.78	29.30	44.28	35.06	45.10	35.45	**245.90**
East Center -- Recyclables	21.88	15.75	26.41	20.36	24.78	20.36	31.33	22.91	29.79	27.74	22.92	28.19	**292.42**
Omohundro – Recyclables	0	0	0	0	0	0	0	0.09	0.00	2.30	0.00	0.15	**2.54**
Anderson Lane – Metal	8.92	10.05	4.52	7.38	5.31	13.8	2.13	0.00	0.00	0.00	0.00	0.00	**52.11**
East Center -- Metal	53.19	47.03	38.12	40.31	24.53	21.41	33.65	25.64	41.94	52.52	53.33	47.54	**479.21**
Omohundro – Metal	0	0	0	0.00	0.00	0	0.00	1.33	7.04	3.45	4.70	4.27	**20.79**
Total Drop-off Facilities	***536.72***	***542.10***	***509.26***	***516.66***	***541.34***	***567.50***	***584.45***	***449.76***	***547.22***	***536.35***	***595.59***	***556.52***	***6,483.47***
Brush Collection:													
Unground -- Grapple Hook	535.17	525.41	529.88	479.13	406.86	277.30	321.82	345.33	550.15	456.55	542.87	605.17	**5,575.64**
Unground -- Dropped Off	481.44	554.49	514.4	600.11	395.22	256.41	339.79	445.77	924.52	658.33	784.04	722.23	**6,676.75**
Unground -- Contractor	1,448.93	1383.71	1,469.89	1,649.02	1,312.09	1,006.44	938.21	876.64	1,445.26	1,632.68	1,694.63	1,878.71	**16,736.21**
Ground – Dropped Off	154.96	171.67	109	86.67	89.15	93.45	59.87	62.56	83.23	61.86	58.36	76.47	**1,107.25**
Leaves -- Metro	0.00	0.0	0.0	0	154.71	194.91	36.25	0.00	4.30	0.00	0.00	0.00	**390.17**
Leaves -- Dropped Off	0.00	0.0	0.0	0.72	0.00	0.00	8.01	3.93	0.00	0.17	0.00	0.00	**12.83**
Total Brush	***2,620.50***	***2,635.28***	***2,623.17***	***2,815.65***	***2,358.03***	***1,828.51***	***1,703.95***	***1,734.23***	***3,007.46***	***2,809.59***	***3,079.90***	***3,282.58***	***30,498.85***

Table 4.1.6.2 Recycling Statistics in Tons (Continued)

Program Type	Tons of Recycled Waste Collected												
Household Hazardous Waste													
	July	*August*	*September*	*October*	*November*	*December*	*January*	*February*	*March*	*April*	*May*	*June*	*Grand Total*
Oil	1.60	0.50	2.00	0.68	2.04	1.34	0.98	1.00	1.74	1.92	1.72	2.30	**17.82**
Anti Freeze	0.00	0.40	0.30	0.40	0.00	0.30	0.16	0.00	0.20	0.00	0.20	0.00	**1.96**
Electronics	0.00	2.63	2.10	2.77	0.00	0.00	0.00	0.00	7.32	0.00	0.00	5.19	**20.01**
Batteries	2.71	2.39	2.00	2.97	3.10	0.95	1.88	1.57	3.40	3.05	4.18	3.61	**31.81**
Tanks	0.34	0.37	0.20	0.00	0.37	0.00	0.92	0.00	0.42	0.40	0.30	0.55	**3.87**
Clean Harbors	0.00	0.00	0.00	19.55	0.00	0.00	0.00	0.00	19.65	0.00	0.00	17.12	**56.32**
Total Household Hazardous Waste	4.65	6.29	6.60	26.37	5.51	2.59	3.94	2.57	32.73	5.37	6.40	28.77	**131.79**
Tires	512.92	885.74	573.97	192.91	932.86	491.35	130.26	394.10	1,012.05	1,282.96	694.58	1,636.51	**8,740.21**
Other Recycling													
Curby Dumpsters	26.92	50.87	43.29	35.80	46.29	34.56	53.61	33.05	45.66	43.20	65.83	32.45	**511.53**
Nighttime Downtown Recycling	7.33	4.43	1.13	0.81	0.39	3.14	0.55	0.0	0.43	0.00	0.00	2.23	**20.44**
Government Building Recycling	24.84	25.84	27.21	25.17	23.56	22.62	29.33	33.45	34.15	25.48	33.39	28.27	**333.31**
Farmer's Market	1.20	1.31	1.70	0.58	1.22	0.63	0.52	0.76	1.35	1.09	1.17	1.03	**12.56**
Radnor Lake	0.57	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	1.18	0.00	**2.65**
Total Other Recycling	**60.86**	**82.45**	**73.33**	**62.36**	**71.46**	**61.85**	**84.01**	**67.26**	**81.59**	**69.77**	**101.57**	**63.98**	**880.49**
Recycling Sub Total	**4,832.57**	**5,209.02**	**4,914.82**	**4,717.56**	**4,921.08**	**4,187.51**	**3,697.28**	**3,635.47**	**5,648.98**	**5,882.95**	**5,476.42**	**6,672.95**	**59,796.61**
Recycling Total *(Recycling Sub Total minus the contamination amount collected at the Rivergate Recycling):*	**4,810.86**	**5,138.17**	**4,872.35**	**4,698.01**	**4,921.08**	**4,187.51**	**3,697.28**	**3,635.47**	**5,648.98**	**5,882.95**	**5,476.42**	**6,672.95**	**59,642.03**

Table 4.1.6.3 Household Hazardous Waste Facility Collection Statistics In Permit Year 3

Material Collected	Household Hazardous Waste Collection July 2005 - June 2006												
	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Totals
Antifreeze	0	0.4	0.3	0.4	0	0.3	0.16	0	0.2	0	0.2	0	**1.96**
Car Batteries	2.67	2.39	2	2.92	3.02	0.95	1.88	1.57	3.4	3.05	4.18	3.61	**31.64**
Consumer Batteries	0.04	0	0	0.05	0.08	0	0	0	0	0	0	0	**0.17**
Electronics	0	2.63	2.1	2.77	0	0	0	0	7.32	0	0	5.12	**19.94**
Other HHW	0	0	0	19.55	0	0	0	0	19.65	0	0	17.02	**56.22**
Paints and Paint Thinners	0	25.51	18.45	0	28.83	0	30.03	25.49	17.37	4.07	23.03	23.68	**196.46**
Tanks	0.34	0.37	0.2	0	0.37	0	0.92	0	0.42	0.4	0.3	0.55	**3.87**
Used Motor Oil	1.6	0.5	2	0.68	2.04	1.34	0.98	1	1.74	1.92	1.72	2.3	**17.82**
												Total	***328.08***

Note: At the time the report was written, PublicWorks was still awaiting a final tonnage report from Clean Harbors for Other HHW which includes pesticides, fertilizers, oil based paint, etc. for June 2006.

4.1.7 Stormwater Detention/Retention Facilities (Part III.B.1.g.)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
1g	Stormwater Detention / Retention Facilities	PY 2		•				

Metro recognizes that planning and acting upon an understanding of location and function of stormwater detention/retention facilities is important to managing water quantity and quality concerns. The NPDES Department has been working on a long-term operation and maintenance strategy for detention/retention facilities, which will include educating the public on proper maintenance procedures/schedules for privately owned facilities as well as inspecting and enforcing on improperly functioning detention/retention structures. The following paragraphs give a brief description on the BMP inspection and maintenance process.

BMP Tracking:
In 2002, Metro hired a consultant to identify all of the projects within the jurisdiction of Metro approved for construction that contain a stormwater quantity and/or quality BMP. The plans for these projects were then scanned onto a hard drive, a GIS layer was created with their locations, and the BMPs were cataloged in a database. The NPDES Department has found, however, that not all of the approved projects were actually constructed and a fraction of this database includes properties that were never developed. All subsequent BMPs are entered into the database once the As-Built Certification is approved by the Stormwater Plan Review Section and final stabilization for the project has been reached.

BMP Inspection Pilot Study:
In order to develop a successful BMP inspection and maintenance program, the NPDES Department, in earlier permit years, conducted a pilot BMP inspection study. In the pilot study, 100 BMPs installed from 1978 – 2002 were randomly inspected from May to July 2004. All (100%) of the BMPs inspected were found to be in need of some form of maintenance. In looking for trends, the BMPs were divided into land use type and ranked by the percentage of the BMPs requiring major maintenance. The results were as follows:

- Condominiums 40%;
- Commercial 43%;
- Churches 71%;
- Schools 75%;
- Industrial 80%;
- Subdivisions 85%; and
- Apartments 100%.

Since the initial pilot study, the NPDES Department has inspected another 100+ BMPs. As a result of these inspections, the NPDES Department issued formal letters to 14 BMP owners outlining maintenance requirements.

BMP Public Education Program:
In permit year 3, the NPDES Department sent over one-thousand flyers to BMP owners that had addresses listed in the BMP database. The flyers notified the property owners that a stormwater BMP was located on

their property and gave general inspection and maintenance information. Approximately 30% of these flyers were returned to Metro due to incorrect or outdated addresses. NPDES staff will try to locate the correct address for each of these projects as time allows. NPDES staff has generated a list of respondents to the mail-out and are addressing any questions/concerns property owners have. In permit year 4, the NPDES Department intends to mail out the notification flyers to the remaining property owners if valid addresses can be obtained. A copy of the notification flyer is attached in Appendix B.

Future BMP Inspections:
MWS BMP inspection program will focus initial inspections on all BMPs owned and/or operated by Metro located in TMDL watersheds. Metro firmly believes that they should set an example for the development community and the NPDES Department intends to facilitate compliance within the framework of Metro government at these sites. Based on the results of the study, Metro will likely prioritize inspections of privately owned BMPs in the following land use order:

- Apartments;
- Subdivisions;
- Industrial;
- Churches;
- Commercial; and
- Condominiums.

The NPDES Department will randomly inspect 20% of the BMPs at apartments, subdivisions, and industrial sites in TMDL watersheds each year. NPDES will also randomly select and inspect 10% of the BMPs in TMDL watersheds located at churches, commercial sites, and condominiums annually. In permit year 5, the NPDES Department will evaluate the effectiveness of its BMP inspection program and possibly expand to 303(d) watersheds.

During the inspections, special attention will be given to whether or not the BMP would be a good candidate for retrofitting for water quality. These include water quantity ponds with outlet structures that could be altered to detain water for longer periods of time. Small quantity ponds with adjacent open space for expansion into a larger pond that could add water quality treatment will also be noted. Other retrofit projects could entail adding a new BMP in series with the existing BMP to add or increase or water quality treatment. Inspectors will pay extra attention to the potential for BMP retrofitting at Metro owned facilities.

BMP Retrofit Program:
MWS has investigated retrofitting two Metro sites. The first project requested bids for repaving a parking lot and integrating Low Impact Development (LID) BMPs at the site. The winning bid included a bioretention cell, grassy swales, and grass pavers. Unfortunately, budget constraints indefinitely postponed this project for now. The other project involves adding water quality treatment to an existing water quantity pond at a Metro library. This project is in the initial site review stages. MWS is also considering a BMP retrofit project at its NPDES facility. The LID BMPs under consideration include treatment wetlands and infiltration/bioretention areas.

The NPDES Department will also consider retrofitting wet weather sample site watersheds. The data collected from wet weather sampling in permit year 4 will be used to characterize the pollutant loading in the watershed. This information will then be used to assess the most effective BMPs for installation.

4.1.8 Future Direction of Element 1 - Operations and Maintenance of Structural Controls

Update Stormwater Infrastructure Inventory (GIS format)
The GIS system will be updated to represent areas of new development, significant redevelopment and Metro drainage construction/modification activities performed since the initial infrastructure inventory. The NPDES office will make every effort to update the MS4 entirely by the end of permit year 4. After permit year 4, the GIS database, at any given time, will be considered to be up to date if infrastructure changes are entered into the system within 6 months of each respective permit year.

Existing System Maintenance
The MWS Stormwater Maintenance Department will continue to maintain the existing public stormwater drainage infrastructure throughout the fourth permit year, in accordance with the decision matrix developed by MWS. It is anticipated that most future large and small maintenance projects will be designed and managed throughout construction by MWS.

Inspections
Metro will continue to inspect the Dry Creek detention facility at least once per quarter. Any other detention/retention facilities that come under Metro ownership will be inspected and maintained accordingly.

Training
In permit year 4, the NPDES Department will expand upon the comprehensive training conducted in permit year 2 to include Metro Codes inspectors, Public Works maintenance workers, and other Metro Departments so that maintenance crews have a complete understanding of water quality issues as they relate to maintenance procedures, as well as identifying and reporting illicit discharges.

Maintenance Procedures
The NPDES Department will continue to look for opportunities in all Metro departments to promote changes to maintenance procedures that will benefit water quality.

Housekeeping Programs
The Department of Public Works will continue the existing housekeeping programs as a part of its ongoing waste management program.

Stormwater Detention/Retention Facilities
As mentioned above, emphasis on this program will be dramatically expanded in future permit years.

4.2 Control of Discharges from Areas of New Development and Significant Redevelopment (Part III.B.2.)

The goal of this portion of the SWMP is to satisfy the requirements of Permit Part III.B.2. This section was designed to minimize the long-term impacts of new development and significant redevelopment on water quality. Specific activities include enforcing ordinances and regulations that are supported by guidance materials for the proper placement of BMPs and educating local stakeholders about their roles in minimizing long-term water quality impacts.

4.2.1 Ordinances, Regulations and Guidance (Part III.B.2.a.)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
2a	Ordinances, Regulations, and Guidance	----						
	Enforce Existing Ordinances and Regulations intended to limit long-term water quality impacts	Ongoing	•	•	•			
	Public Education	Ongoing	•	•	•			

Ordinances, Regulations, and Guidance

During the previous permit year, MWS completed the process of identifying needed changes to its stormwater program. Some of the changes MWS is recommending and hopes to include in the revised Stormwater Management Manual included:

- Expanding stream buffers;
- Streamlining enforcement;
- Promoting Low Impact Development;
- Redefining stormwater quality program goals and requirements;
- Examining floodplain management and detention policies; and
- Better defining program responsibilities.

Enforce Existing Ordinances and Regulations

The NPDES office has continued to enforce the provisions of the existing stormwater regulations. Table 4.2.1.1 presents the documented enforcements conducted since 2002, while table 4.2.1.2 depicts the administrative penalties issued in the program's history. It is important to note that SWOs and NOVs are issued on the same enforcement letter. SWOs are reserved for sites with more significant stormwater issues, in which an on-going activity is causing an illicit discharge or other stormwater violation. There were a total of 283 enforcements issued with $51,250 of administrative penalties issued during permit year 3.

Table 4.2.1.1 NPDES Enforcement Cases

Time Frame	Notices of Violation	Stop Work Orders
April 2002 – June 2002	11	1
July 2002 - June 2003	47	23
July 2003 - June 2004	132	96
July 2004 - June 2005	151	46
July 2005 – June 2006	219	64
Totals	**560**	**230**

Table 4.2.1.2 Enforcement Penalties Issued

Month	NOV	SWO	Monthly Total
Dec-03	$2,900	$2,000	$4,900
Jan-04	$3,500	$1,600	$5,100
Feb-04	$1,650	$3,100	$4,750
Mar-04	$2,850	$4,00	$3,250
Apr-04	$2,800	$4,450	$7,250
May-04	$2,450	$2,000	$4,450
Jun-04	$3,700	$4,400	$8,100
Jul-04	$3,300	$1,800	$5,100
Aug-04	$3,500	$3,300	$6,800
Sep-04	$2,350	$1,000	$3,350
Oct-04	$3,450	$1,800	$5,250
Nov-04	$7,200	$1,200	$8,400
Dec-04	$200	$400	$600
Jan-05	$1,000	$1,100	$2,100
Feb-05	$1,100	$1,400	$2,500
Mar-05	$3,900	$0	$3,900
Apr-05	$1,100	$300	$1,400
May-05	$1,000	$1,600	$2,600
Jun-05	$750	$800	$1,550
Jul-05	$1,450	$500	$1,950
Aug-05	$4,050	$0	$4,050
Sep-05	$3,250	$1,200	$4,450
Oct-05	$2,000	$500	$2,500
Nov-05	$3,250	$2,800	$6,050
Dec-05	$3,000	$400	$3,400
Jan-06	$3,900	$2,700	$6,600
Feb-06	$850	$500	$1,350
Mar-06	$4,750	$1,600	$6,350
Apr-06	$5,200	$700	$5,900
May-06	$4,350	$800	$5,150
Jun-06	$3,200	$300	$3,500
PY 3 Total	$39,250	$12,000	$51,250
Grand Total	$87,950	$48,250	$136,200

Public Education
Metro continues to educate the general public on local stormwater regulations using a variety of outlets, which include public access channel television advertisements, web site information, hand-outs, etc. The public education program is discussed in further detail in Section 4.10.

4.2.2 Stormwater Best Management Practices (Part III.B.2.b.)

Contact Name: Rebecca Dohn MWS Engineering Section, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
2b	Report BMP Monitoring and Considerations	Annually	•	•	•			

As mentioned earlier, Metro continued to monitor BMP sites in permit year 3. There were no BMP sites sampled during permit year 3 to determine the pollutant reduction of different types of BMPs. Metro recognizes that regional facilities and the facilities retrofitted to improve pollutant capture efficiencies are important to the long-term success of an MS4 program. Refer back to Section 4.1.7 of this document for an explanation of the BMP monitoring and retrofitting considerations.

4.2.3 Master Planning (Part III.B.2.c.)

Contact Name: Danny Smith, MWS Engineering Section, 615.862.4799

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
2c	Master Planning	PY 2 and 5		•				

Master planning is essential to the long-term success of a water quality management program. NPDES understands that the Metro Planning Department is a critical facilitator in this area and in related processes. Therefore, NPDES intends to work closely with Metro Planning Department staff in upcoming permit years to help facilitate this process as well as initiate internal Master Planning activities within the Stormwater Division as it relates to overall Stormwater quality and quantity considerations.

The Mill Creek watershed has been identified as a watershed of importance in Davidson County. As mentioned in previous annual reports, Metro has provided funds to the U.S. Army Corps of Engineers to conduct a study on the Mill Creek watershed. The main goal for the study is to improve environmental sustainability within the watershed. It was anticipated early in the study that one possible outcome would be a model that could be applied in other watersheds across the county. However, given the differing characteristics of watersheds, it appears that the product of the watershed study will be "Ecosystem Restoration Alternatives" and "Flood Damage Reduction Alternatives" specific to the Mill Creek Watershed. Therefore, this model will most likely not be directly applicable to other watersheds. Some of the types of projects identified in the Mill Creek Watershed Study, however, may be able to be applied to other watersheds across the county.

As mentioned in last year's annual report, MWS hired a watershed manager whose main focus will be to evaluate State-listed 303(d) impaired watersheds in Davidson County. The watershed manager has been initiating programs to identify the source of the impairments and potential activities that can be undertaken to improve water quality within the watersheds. In addition, another focus of the watershed manager will be to prevent the unimpaired watersheds from becoming impaired.

4.2.4 Training (Part III.B.2.d.)

Contact Name: Danny Smith, MWS Engineering Section, 615.862.4799

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
2d	Training	Annually	•	•	•			

MWS believes firmly in technical training of stormwater plan review and inspector staff on latest techniques and management practices to address long-term water quality. Table 2.5.1 in Section 2 of this document depicts the technical training that MWS stormwater staff received during permit year 3.

MWS stormwater inspectors and engineers have received Level I EPSC training from TDEC. The Level I training is a foundation-building course intended for individuals involved in land-disturbing activities covered by TDEC's Construction General Permit, including inspection and enforcement personnel from all levels of government, plan preparers and reviewers, designers, and engineers. The course gives participants a solid working knowledge of erosion and sedimentation processes and practices. Most of the MWS stormwater plan review engineers have received the Level II EPSC training, which is an advanced two-day course that is specifically designed for engineers, environmental designers, and plan preparers and reviewers. In the Level II course, detailed instruction is given on the engineering technologies needed to control stormwater on a construction site. Workshop participants obtain the tools needed to develop an acceptable, working erosion and sediment control plan as described in TDEC's *Tennessee Erosion & Sediment Control Handbook* and required by the Tennessee General Construction Stormwater Permit.

4.2.5 Future Direction of Element 2

Ordinances, Regulations, and Guidance

MWS will continue to take steps toward more effective enforcement of local regulatory mechanisms in order to enhance water quality. MWS will continue to review the effectiveness of the regulations and reserve the right to provide updates when deficient areas are encountered.

Best Management Practices (BMPs)

MWS recognizes that regional BMP facilities and the facilities retrofitted to improve pollutant capture efficiencies are important to the long-term success of an MS4 program. The NPDES Department will continue to implement the BMP inspection program in the upcoming permit years.

Master Planning

MWS recognizes that master planning is essential to the long-term success of a water quality management program. MWS also understands that the Metro Planning Department is a critical facilitator in this area and related processes. Therefore, MWS intends to work closely with Metro Planning Department staff in the upcoming permit years to help facilitate the long-term planning process that promotes development responsible to stormwater quality.

Training

MWS will continue to look for training opportunities for grading permit plan reviewers on the latest techniques and management practices to address long-term water quality issues. MWS will also provide training for the development community on stormwater program changes, such as those resulting from the regulations revision process.

4.3 Roadway Maintenance (Part III.B.3.)

The objective of this section is to satisfy Part III.B.3 by reducing impacts to stormwater runoff from roadways. This objective is accomplished by examining several programs including catch basin cleaning, downtown street sweeping, management practices for the use of deicing chemicals, stormwater controls at salt storage areas, management practices in the use of herbicides, and spill response. Furthermore, roadway design criteria, construction requirements, and street maintenance responsibilities were explored.

4.3.1 Catch Basin Cleaning (Part III.B.3.a.)

Contact Name: Denny Bone, MWS Maintenance Section, 615.862.4537

	Activity	SWMP Schedule	1	2	3	4	5	Comment for PY 3
3a	Prioritize catch basin cleaning activities	PY 1	●					
	Report catch basin cleaning activities	Annually	●	●	●			

MWS Stormwater Routine Maintenance Department has continued the basic program of catch basin cleaning into the third year of the Cycle 2 permit. The Stormwater Routine Maintenance Department cleaned out over 35,000 catch basins during the permit year 3. Table 4.3.1.1 presents the statistics on catch basin cleaning from year 4 of the first NPDES permit cycle through year 3 of the second permit cycle. Since the stats have been tracked nearly 115,000 catch basins have been cleaned.

Table 4.3.1.1 Catch Basin Cleaning

Type of Maintenance	Permit year 4 Cycle 1	Permit year 5 Cycle 1	Permit year 1 Cycle 2	Permit year 2 Cycle 2	Permit year 3 Cycle 2	Total Since Tracking Began
Routine	177	7,278	33,495	37,296	35,258	113,504
Complaint	0	260	416	353	263	1,292
Class C	0	0	0	5	0	5
Total	177	7,538	33,911	37,654	35,521	114,801

The Stormwater Routine Maintenance Department uses two trucks mounted with a pressure wash and vacuum system to clean catch basins. They are used daily to clean storm inlets and pipes that are clogged. Maintenance crews perform inspections for required cleanings and are on call to address other reports of clogged inlets as they are received.

Figure 4.3.1.1 Vactor Truck

4.3.2 Downtown Street Sweeping (Part III.B.3.b.)

Contact Name: David Himes, MDPW Streets Services Division, 615.862.8716

	Activity	SWMP Schedule	1	2	3	4	5	Comment for PY 3
3b	Downtown street sweeping	Ongoing	●	●	●			

The Department of Public Works (MDPW) is responsible for downtown street sweeping and has set a goal of sweeping approximately 1,400 miles of street per month. Public Works has 4 large street sweeping trucks that are used daily. During permit year 3, Public Works exceeded their goal by sweeping approximately 23,397 miles of street, which averages over 1,900 miles of streets swept per month. The street sweeping program led to the collection and disposal of approximately 884 tons of debris that had collected on the street in permit year 3 that would have otherwise drained to the storm drains. Public Works also strives to sweep every curbed and guttered street once per month. Metro will continue to review the procedures associated with these programs to benefit stormwater runoff quality.

4.3.3 Deicing Practices (Part III.B.3c.)

Contact Name: David Himes, MDPW Streets Services Division, 615.862.8716

	Activity	SWMP Schedule	1	2	3	4	5	Comment for PY 2
3c	Evaluate Metro application and storage practices and Report modifications	PY 1 and 3	●		●			

The management practices for deicing chemicals storage and application practices were first addressed in the 1992 Part 2 Application. Since then, many initiatives have been undertaken that have minimized the water quality impacts of roadway salt application, which is required occasionally during the winter months to create safer driving conditions in Davidson County. Specific aspects of this program are summarized below.

Prior to the formation of the NPDES Program, Public Works conducted a series of studies to determine the safest, most effective, and most economical roadway deicing agent available. These studies concluded that salt was the best deicing agent alternative for Metropolitan Nashville and Davidson County. MDPW has since initiated brine deicing of the roadways prior to winter storms to prevent ice from binding to the roadway. This preventative measure has resulted in a reduction of the total amount of salt applied directly to the roads. Brine de-icing can be applied at a much lower rate with successful results, thus reducing chlorides in stormwater runoff and cutting salt usage costs.

MDPW Maintenance Section Salt Usage
Salt costs Metro approximately $33 per ton. Metro prepares for each winter season with approximately 8,000 tons of salt in storage, with any unused salt held until the next year. Metro Public Works currently receives its salt in 1,500-ton barge loads, which is transferred to three strategically located, covered bins. During the permit year 3 winter season, approximately 1,460.94 tons of salt/brine were applied to the roadways in Davidson County. Icy weather conditions have occurred infrequently in Davidson County over the past few years, and consequently MDPW has abundant salt reserves that must be stored. Closer attention has been given to management practices applied at salt storage bins.

Salt Storage Facilities
Metro currently has three salt storage facilities. They are located at Public Works East Center, Public Works West Center, and at the Smith Springs Facility. Brine solution is created at the South 5th facility and then stored in sealed units at each of the sites. All three sites have concrete bins in which the salt is stored, making impacts to stormwater runoff non-existent if salt is not tracked outside of the bin areas. Each site has operating procedures aimed at eliminating and/or cleaning up salt tracked from the bins. MWS NPDES Department personnel periodically inspect the three bin sites to monitor the effectiveness of these procedures. Any observed deficiencies are reported to the proper MDPW officials. Results of inspections performed during Permit year 2 are found in Table 4.3.3.1.

Table 4.3.3.1 Salt Bin Inspections Results

Date of Inspections	Public Works East Center	Public Works West Center	I-24/Briley Parkway old Everett Rock Quarry	Public Works Smith Springs
19-Jun-03	Bin 1/4 full, no sign of discharge or loss. Salt completely covered.	Bin 1/2 full, no sign of discharge or loss. Salt completely covered.	Bin empty of salt. Being used as storage of Averitt equipment and supplies. No signs of discharge.	
22-Oct-03	Bin 1/4 full, no sign of discharge or loss. Salt completely covered	Bin 1/2 full, no sign of discharge or loss. Salt completely covered.	Will not be used this year per David Himes.	Bin 3/4 full, no sign of discharge or loss. Salt completely covered. (added this bin this fall)
19-Dec-03	Bin full. Trace of salt exposed. No evidence of discharge.	Bin full. Trace of salt exposed. No evidence of discharge.	Not in use.	Bin full. Trace of salt exposed. No evidence of discharge.
15-Jan-04	Bin full. No evidence of discharge.	Bin full. Trace of salt exposed. No evidence of discharge.	Not in use.	Bin full. Trace of salt exposed. No evidence of discharge.
20-Feb-04	Bin full. No exposed salt.	Bin full, some exposed salt. Salt spilled at parking and drive.	Not in use.	Bin full, some exposed salt. Signs of salt being washed away.
24-Mar-04	Bin full. No exposed salt.	Bin full. No exposed salt.	Not in use.	Bin full. No exposed salt.
21-May-04	Bin full. No exposed salt.	Bin full. No exposed salt.	Not in use.	Bin full, some exposed salt. Signs of salt being washed away.
30-Jul-04	Bin full. No exposed salt.	Bin full. No exposed salt.	Not in use.	Bin full. Minor exposed salt. No signs of washing away.
28-Oct-04	Bin full. No exposed salt.	Bin full. No exposed salt.	Not in use.	Bin full. No exposed salt.
27-Apr-05	No exposed salt.	No exposed salt.	Not in use.	Exposed salt.
25-Jul-05	No exposed salt.	No exposed salt.	Not in use.	Small amount of exposed salt.
08-Dec-05	No exposed salt	No exposed salt	Not in use.	No exposed salt
17-Jan-06	No exposed salt	No exposed salt	Not in use.	No exposed salt
02-Mar-06	No exposed salt	No exposed salt	Not in use.	Some exposed salt
10-Jul-06	Good amount of exposed salt but given the site elevations, salt does not appear to be migrating away from the pile	Empty	Not in use.	Some exposed salt leaching to storm drain.

Salt and Brine Application Control

In 1996, spreader control systems were installed on all Public Works spreader trucks. These systems consist of a computer that dictates the salt spread rate based on a pre-set application rate (determined by the severity of weather conditions) that corresponds to truck speed. This means that as the trucks slow down or stops the salt spreader slows or stops correspondingly, reducing the amount of salt that is wasted or over-applied. The spread rates used follow nationally recognized spread rates. This computer-aided system has resulted in a 25% annual reduction in salt use. It is reasonable to assume that these reductions are realized each salt application season. In addition, MDPW has added additional trucks to apply a brine solution at a continuous rate on the roadways of predetermined routes in anticipation of possible icy conditions. This further reduces the need to apply salt directly to roadways. Reducing direct salt application also helps prevent road damage due to salt application, and creates a reduction in the possible consequences of water quality.

Automated Road Data
Metro can access automated data from five roadway sensor-sampling sites that supply real-time data (road surface temperature, moisture, subsurface sensor at 18 inches, salt brine percentage, and weather conditions including: temperature, wind speed, dew point, percent humidity) to the main Public Works office. Metro uses this information to determine when salt or brine application needs to begin (road surface temperature registers at or near 32° F) or when salt needs to be reapplied to roads that have already been salted (roadway salt solution percentage drops below the known level needed to prevent ice from forming/reforming). Additionally, Metro subscribes to a real-time weather radar service that allows officials to be more accurate in predicting when and if frozen precipitation is to begin. This prevents the unnecessary application of salt in cases where expected snow or ice does not develop or move into Davidson County as predicted.

Salt and brine application controls and real-time road data have been instrumental in allowing Metro to better manage salt application in areas where water quality can be greatly affected by careless deicing practices, such as bridges located in close proximity to water bodies, waterways, or conveyances. Metro coordinates with the Corps of Engineers on icy roadway conditions on the Bell Road bridge over Percy Priest dam. The Corps of Engineers does not want salt applied to the section of road over the dam. Instead, this section of road is closed during hazardous driving conditions.

Metro's Salt Application Area
The State of Tennessee's Department of Transportation (TDOT) is responsible for both the Interstate and State Highway systems. In actuality, the State only has the resources to salt the Interstate system and approximately one-half of the State Highway system within Davidson County. Therefore, Public Works currently salts the other half of the State Highway system and all major Metro roads. Public Works has formulated a list of roads within Davidson County that are the most problematic during icy conditions. These roads are the first to receive salt with other roads being salted as deemed necessary by Public Works, based on information received from the Police Department, other Metro Departments, citizens, etc.

4.3.4 Herbicides, Pesticides, and Fertilizers (Part III.B.3.d.)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
3d	Evaluate Herbicides, Pesticides, and Fertilizers application and storage practices	PY 1 and PY 3	•		•			

During the formative stages of Metro's MS4 NPDES permit program, evaluations of the applications and storage practices of herbicides, pesticides, and fertilizers were focused on Metro Public Works, where NPDES staff initially served. During the investigation of usage practices, it was determined that little, if any, routine usage of these substances occurred. The same situation is also true for Metro Water Services (MWS), where NPDES Office staff currently serves. In an effort to gain more knowledge about the amounts, types, storage, and application practices of Metro departments, the NPDES Department sent out general information request sheets to various Metro departments. In permit pear 4, the NPDES Department plans on implementing an Environmental Compliance Inspection (ECI) program that will focus on Metro locations, especially those properties identified in the general information request forms as containing pesticides, herbicides, insecticides, and automotive fluids. The ECI program will be a resource on proper storage, mixing, and application procedures for maintenance activities.

4.3.5 Spill Response Program (Part III.B.3.e.)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

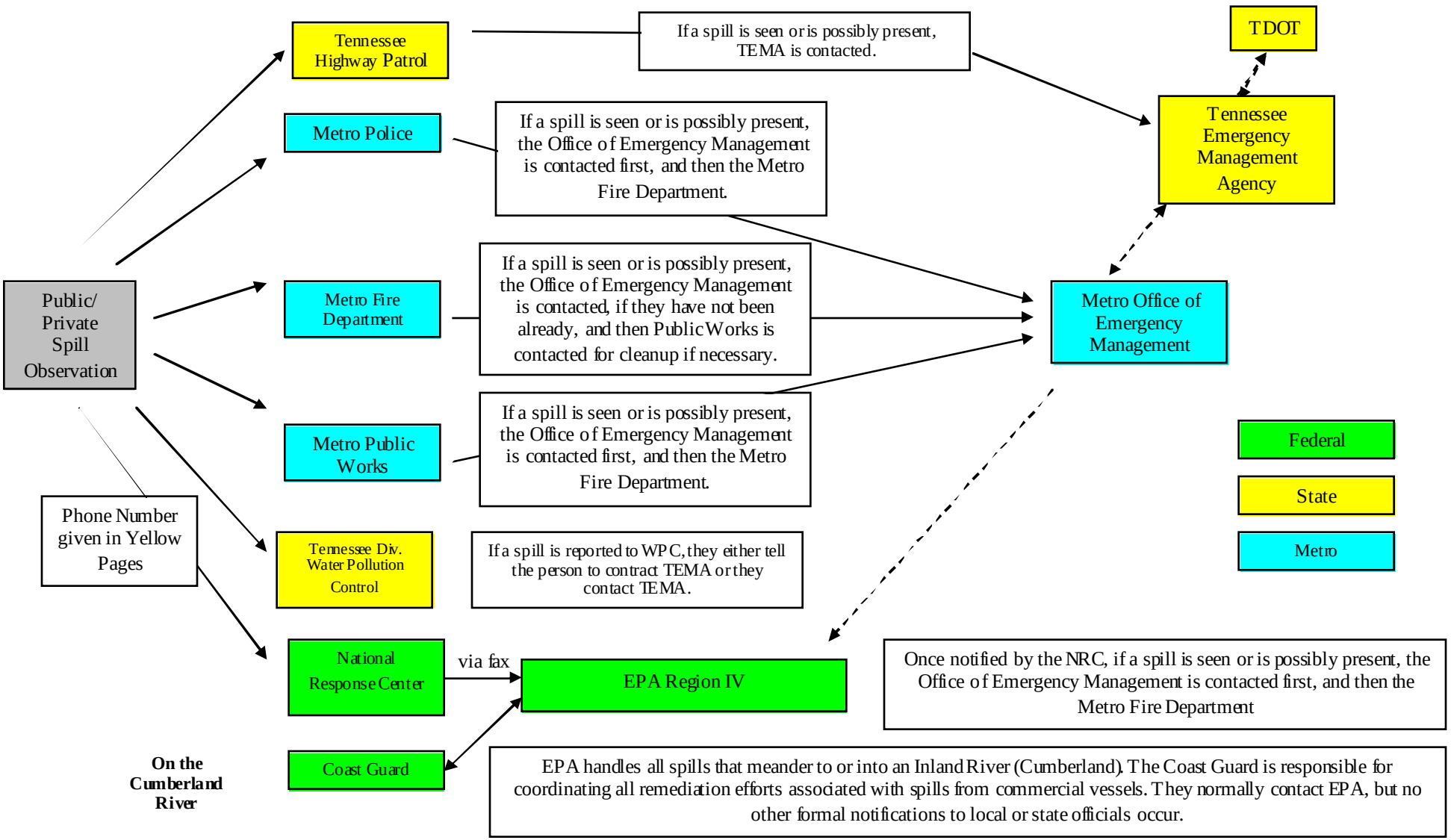
Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
3e	Report on Spill Response Program	Annually	•	•	•			

The Metropolitan Nashville and Davidson County Emergency Management Plan (EMP) has developed policies and procedures to coordinate multi-departmental response and recovery from spill incidents. In the Nashville-Davidson County area, small-scale emergencies are typically managed on the scene. Primary responsibility varies among the different agencies depending upon the type of incident. The principal agency should be responsible for taking control of the on-the-scene management of the incident by directing rescue, recovery, and control. The primary HAZMAT responsibilities fall to the Fire Department (Hazard 12 unit) with Public Works contributing two HAZMAT teams and Water Services contributing one HAZMAT team. Principal agency assignments are explained in detail within the EMP. If more than one Metro agency is involved, coordination of overall emergency management related activities is done through the Office of Emergency Management (OEM).

Figure 4.3.5.1 illustrates the order of response and communication protocol. The EMP calls for the Fire Department to be the first contact in the event of a spill. The Fire Department responds, assesses the situation, notifies OEM, and calls Public Works HAZMAT to either perform the cleanup or to notify remediation contractors if the scope of the spill is greater than Public Works can address. The response times for all Fire Department locations in the county are estimated to be less than four minutes. The HAZMAT team is able to respond throughout the county within six to ten minutes. The NPDES office has someone on call 24 hours a day, 7 days a week, to respond to spills from internal notifications or from OEM that are believed to involve stormwater. During permit year 3, the NPDES office documented approximately 47 spill responses in the City Works database. In permit year 3, the NPDES Department also started responding to sanitary sewer overflows that were near streams. These responses were also documented as spills in the tracking database. Some spill calls that are received and responded to during normal business hours are treated as water quality complaints/illicit discharge investigations.

In addressing spill areas, the policy for the Fire Department, unless case of emergency, is to no longer wash spills into the MS4. Instead, bag absorbents are used to capture and/or stabilize the spill material. The Public Works HAZMAT teams generally respond to all spills where absorbent has been applied. On the smaller spills, the Public Works HAZMAT team usually performs the necessary cleanup. A list of the spills that the Public Works HAZMAT team responded to in permit year 3 is included in Attachment A. Larger spills that require more involved cleanup activities are usually contracted out for clean-up. If the party responsible for the spill can be identified, Metro seeks compensation for the remedial activities. If identification of the responsible party is impossible, the costs of remedial services are ultimately borne by the Metro.

Figure 4.3.5.1 Metro EMP Order of Response and Communication Protocol for Spills



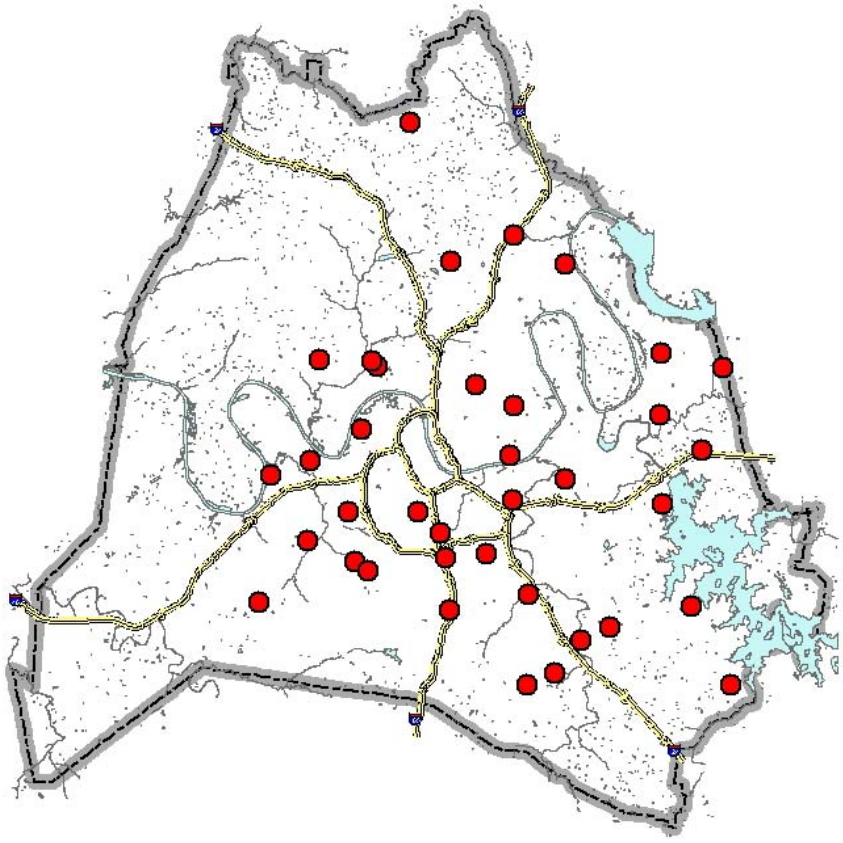
Spills that occur at locations allowing rapid migration into waterways or conveyances would represent a potentially severe threat to water quality in Davidson County. Such spill locations would include sites in the proximity of creeks or streams, sites from which closed impervious stormwater sewer systems route directly to creeks or streams, spills from mobile vehicles on or near waterway bridges, and spills from vessels on waterways. In looking at specific industry types that have the greatest likelihood of having an impact on water quality, companies that transport large volumes of chemicals on a routine basis such as railroad, trucking, and barge companies would be considered to present the greatest threat of an impacting spill. Any companies that handle or utilize chemicals and/or compounds that are extremely poisonous, hazardous, toxic, etc. would also be considered to pose a threat to water quality and should have sophisticated spill prevention measures in place. The NPDES program gives special attention to these and all industries during inspections and complaint investigations to ensure that necessary precautions are taken at each site to prevent spills from impacting water quality.

Historical spill data for Davidson County indicates that the majority of spills do not generally pose an immediate threat to "Waters of the State". Most spills did not reach waterways or conveyances such that water quality impacts to "Waters of the State" occurred. However, the NPDES Program will continue to monitor spill trends within the county and will remain ready to take necessary actions to address pertinent spill issues. Figure 4.3.5.2 depicts some photos of typical spills the NPDES office staff have responded to in the past.

Figure 4.3.5.2 Typical Photos of Spills and Cleanup Activities

In general, the NPDES Department only responds to spills involving storm drains and creeks. Excluding sanitary sewer overflows, the majority of spills that the NPDES Department responds to are located along roadways. Since many of the spills happen on highways and interstates, the NPDES Department has entered into an agreement with the Tennessee Department of Transportation (TDOT) to better address spill issues on State roadways/Interstates (from which spill might otherwise route into the Metro MS4). Figure 4.4.5.3 depicts the locations of the some of the spill/overflow response investigations conducted by the NPDES Department in permit year 3.

Figure 4.3.5.3 Map of Spills Responded to in Permit Year 3



4.3.6 Design and Construction (Part III.B.3.f.)

Contact Name: Danny Smith, MWS Engineering Section, 615.862.4799

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY2
			1	2	3	4	5	
3f	Report Modifications to Design and Construction	Each Compliance Report	•	•	•			

Roadway design criteria and construction requirements have been reviewed by Metro. The following design considerations were recommended to the Public Works engineering department for reducing the impact of roadways on stormwater pollution:

1. Consider use of permanent treatment control BMPs for all new roads and extension of roads in newly developed areas.
2. Consider use of permanent treatment control BMPs for projects involving rehabilitation of existing roads if roadway runoff impacts a sensitive water body.
3. Use swales and buffer strips whenever possible.
4. Consider the use of vegetated or bio-engineered drainage ditches in lieu of rip rap whenever possible.
5. Integrate permanent treatment BMPs with temporary construction BMPs whenever possible.
6. Develop design guidelines for permanent treatment BMPs on the basis of specific hydrologic characteristics of the Metro area.

MWS has been able to incorporate some of these recommendations in roadway designs under the control of Metro. One example is the Holt Road repairs. Holt Road is a heavily traveled, two-lane roadway with no shoulder and is subject to flooding during heavy rain. During the first permit year Metro designed the project to decrease the likelihood of flooding by increasing the size of nine cross drains in a span of approximately one mile. Six of these cross drains being replaced and improved with slab bridges. A slab bridge is a 3-sided (bottomless) box culvert. These can be installed more quickly than regular box culverts and cause less disruption to Holt Road traffic and less impact to the stream, both during construction and after construction. Approximately 2,100 square yards of erosion control matting, instead of rip-rap, will be used on the upstream and downstream sides of the cross drain installations. This project was completed in permit year 3. Figure 4.3.6.1 is a photograph of one of the bottomless bridges.

Figure 4.3.6.1 Photo of One of the Crossings During Construction

4.3.7 Future Direction of Element 3 - Roadways:

Catch Basin Cleaning and Downtown Street Sweeping

The Stormwater Routine Maintenance Department will continue the ongoing program of catch basin cleaning throughout the permit cycle. The number of catch basins cleaned due to complaints as well as the routine maintenance program is

anticipated to increase. The Department of Public Works will continue the ongoing program of sweeping the streets on a monthly basis in the downtown Metropolitan area.

Deicing Chemicals
The Department of Public Works will continue to utilize a combination or either salt or a brine solution as deicing agents for Metropolitan Nashville and Davidson County. The NPDES Department will continue to evaluate deicing application and storage practices to determine if any additional or alternative measures might benefit water quality from roadway runoff and salt bin storage locations.

Herbicides, Pesticides and Fertilizers
The NPDES Department will continue the Environmental Compliance Inspection program for Metro facilities and practices that store and apply chemicals. The NPDES Department will also continue to educate all Metro departments on proper techniques of land maintenance, including the application of chemicals.

Spills
The NPDES Department will continue to work with other Metro departments in responding to and documenting the water quality impacts and cleanup efforts of spills and sanitary sewer overflows. The NPDES Department has also entered into discussions with TDOT to reconcile their new MS4 NPDES permit obligations relating to spill response on State roadways in an effort to clearly identify respective responsibilities.

Design and Construction
Any modifications to the standards and procedures applied to reviewing roadways proposed by developers and/or Metro road construction projects will be reported if they are found to benefit water quality. The NPDES Department will continue to work with the Public Works to try to promote water quality considerations in roadway design.

4.4 Landfills and Other Waste Treatment, Storage, or Disposal Facilities (Part III.B.4)

The objective of this program element of the SWMP is to satisfy Part III.B.4, which will minimize the impacts of municipal facilities on stormwater quality. This includes the investigation of closed and open municipal landfills and other treatment, storage or disposal facilities for municipal waste, including transfer stations, maintenance and storage yards for transportation fleets, and sludge application sites. These investigations are to be used as a basis for establishing procedures and prioritization of control measures for reducing pollution in stormwater discharges at these sites.

4.4.1 Monitor Water Quality-Related Activities (Part III.B.4.a)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
4a	Monitor Activities, Report on Issues	Ongoing	•	•	•			

Active Landfills

The Public Works, Division of Waste Management (DWM) is responsible for monitoring active and closed landfills within Metro Davidson County. Currently, only two privately owned landfills operate in the county: Southern Services and Odell Binkley landfills. These landfills receive only demolition waste and operate under TDEC Division of Solid Waste Management permits. No active landfills within Davidson County that receive household hazardous waste. There have been no stormwater runoff issues reported to the NPDES Department by the DWM. The NPDES office has visited the Southern Services Landfill on numerous occasions with only minor issues noted. The landfill is required to wash down the road periodically for dust control measures. During permit year 3, the NPDES Department met with personnel from the landfill and pointed out that washing of the road was causing some suspended solids to discharge directly into a nearby ditch. The landfill quickly installed a rock check with filter fabric to filter the runoff as a result from the road washing. In follow-up inspections, the control measures have proven to be effective.

Figure 4.4.1.1 Photograph of the Rock Check Dam Placed at the Exit to Southern Services Landfill

Inactive Landfills

Currently there are no active Metro-operated landfills located within Davidson County. The most recent Metro-operated landfill to close was the Thermal Ash Monofill located in North Nashville. The capping and stabilization of this landfill was completed during permit year 2.

Metro DWM is currently required to monitor 5 inactive landfills, which includes the Bordeaux Landfill, Thermal Ash Monofill, Due West Landfill, Lebanon Road Landfill, and River Hills Monofill. Only two of these landfills (Thermal Ash Monofill and River Hills Monofill) are required to be monitored per requirements of the Tennessee Multi-Sector Industrial Stormwater Permit. Consultants have been hired by Public Works to perform the required sampling and necessary follow-up. Table 4.4.1.1 contains the results from the stormwater sampling performed in permit year 3. The elevated Magnesium levels at the River Hills Landfill are thought to be due to surface water runoff from the road. The elevated Magnesium and Aluminum levels at the Thermal Ash Monofill are thought to be due to the closure construction. Metro will continue to monitor for these levels. Photographs of the Metro-monitored landfills are depicted in Figure 4.4.1.2.

Table 4.4.1.1 Stormwater Sampling Results from Permit Year 3

Landfill Name	Landfill Type	Address	Contact Name	Contact Phone	Sample Results (mg/l)			
					Al	Fe	Mg	TSS
Metro River Hills Landfill	Municipal Combustor Ash Monofill	1821 River Hills Drive	Clayton Hand	862-8623	0.6	0.5	3.8	6.3
Metro Themal Ash Monofill	Municipal Combustor Ash Monofill	1915 Cement Plant Road	Clayton Hand	862-8623	0.96	0.51	3.3	4.7

Figure 4.4.1.2 Municipally-Operated Landfills (Inactive)

Bordeaux Landfill

River Hills Landfill

Due West Landfill

Lebanon Road Landfill

Thermal Ash Monofill

Treatment, Storage, or Disposal Facilities Investigation
In addition to active and inactive landfills located within Davidson County, there are two privately-operated waste transfer stations that receive and temporarily store household hazardous waste: BFI Transfer Station on Freightliner Drive and the Waste Management Transfer Station on Antioch Pike. These facilities were routinely inspected by the DWM for housekeeping issues during permit year 3.

According to the latest list produced by the EPA there are 8 recognized Treatment, Storage and Disposal (TSD) sites located within Davidson County that are still in operation. Two of the eight facilities have already been inspected by the NPDES Department and no major stormwater issues were observed. The remaining TSD sites are scheduled to be inspected by the end of permit year 4. Table 4.4.1.2 lists the TSD downloaded from the EPA Envirofacts website that were found to still be in operation.

Table 4.4.1.2 List of TSD Sites Downloaded from the EPA Envirofacts Website

Facility Name	Facility Address	Handler ID#
Clean Harbors/Safety Kleen	215 Whitsitt Rd	TND981474125
E. I. Dupont De Nemours & Co	1002 Industrial Road	TND047001979
IIGI Adhesives Inc	6100 Centennial Blvd	TND001981240
John P Saad & Sons, Inc.	3655 Trousdale Dr	TND065833543
Lambs Cleaners	310 East Trinity Lane	TND034836866
Lion Oil Company, Nashville Terminal	90 Van Buren Street	TND052143070
Metroplex Limited	2300 Clifton Pike	TND004038790
Mid-State Plating Company, Inc.	14th Avenue North	TND004046033

Note: The facilities shaded in light gray have already been inspected.

Solid Waste Haulers
The Public Works Waste Management Division issues licenses to haulers of municipal waste in Davidson County. NPDES Department and the Waste Management Division previously agreed to implement, as a condition of receiving the annual solid waste haulers license, a certification statement to be signed by a designated representative of the licensee that stipulates operations permitted by the license shall not contribute to either illicit discharges or stormwater runoff pollution. Figure 4.4.1.3 is a copy of this new certification statement. Following the statement is a list of all Metro solid waste haulers who have signed this certification statement (Table 4.4.1.3).

Figure 4.4.1.3 Certification Statement

Stormwater Quality Certification Statement for Metro Division of Solid Waste Licensees

On July 1, 1996, the Metropolitan Government of Nashville & Davidson County (Metro) was issued an NPDES Permit from the Tennessee Division of Water Pollution Control in accordance with the Federal Water Quality Act of 1987. This permit requires Metro to initiate various programs and activities aimed at eliminating both illicit and contaminated stormwater discharges within Nashville/Davidson County. Due to these permit responsibilities; henceforth, any entity wishing to secure and maintain a Solid Waste Hauler's License from the Metro Public Works Division of Solid Waste Management must sign and abide by the certification statement below.

I hereby certify, as a duly designated representative of _____ (the licensee), that _____ (the licensee) shall maintain and conduct its entire operation so as to not create or contribute to water pollution within Metro. _____ (the licensee) further understands that failure to meet this requirement can result in a revocation of its Metro Solid Waste haulers license and may additionally lead to other enforcement actions on the part of Metro's NPDES Program.

Note: Water Pollution is considered to include, but is not limited to; illicit discharges (to storm drains, ditches, or creeks) and/or contaminated stormwater runoff and discharges. This stipulation applies to locations utilized by the Solid Waste license holder on a routine basis to conduct its business such as; fleet maintenance/storage sites, transfer stations, and any other location that might be impacted by the license holder's operations. This stipulation shall also extend to any other operational activities related to the exercising of rights granted by the Metro Solid Waste Hauler's License. If you have any questions as to what would create or constitute a water pollution issue, please contact Metro's NPDES/Water Quality Program at (615) 880-2420.

_____ **Signature** _____ **Date**

_____ **Title**

Disclaimer: This certification represents no additional requirements to the licensee as it pertains to State and Federal environmental regulations.

Table 4.4.1.3 Solid Waste Haulers Companies that have Signed the Water Quality Certificate

Issued to	Address	Date issued	Type of Operation
Gray's Disposal	522 Thompson Lane, Nashville, TN 37204	7-1-05	Collector
Waste Removal Services, LLC	164-B Old Carters Creek Pike, Franklin, TN 37064	9-19-05	Collector
Crick Disposal Services, Inc.	2635 Hart Street, Nashville, TN 37207	9-21-05	Collector
Welsh Disposal	325 Hillcrest Drive, Madison TN 37115	9-11-05	Collector
Hudgins Disposal Service	400 Crutcher Street, Nashville, TN 37206	9-23-05	Collector
Waste Management, Inc.	1428 Antioch Pike, Antioch, TN 37013	9-15-05	Operator
Waste Management, Inc.	1428 Antioch Pike, Antioch, TN 37013	9-15-05	Collector
J. E. McMurtry	103 Donald Street, Nashville, TN 37207	10-1-05	Collector
Red River Service Corp.	120 Ewing Drive, Nashville TN 37207	11-2-05	Collector
MS-COT SERVICES LLC	3516 Central Pike, Hermitage, TN 37076	9-27-05	Operator
Landscape Services, Inc.	204 River Hills Drive, Nashville TN 37210	9-22-05	Landscaper
Southeastern Recycling	1029 3rd Avenue South, Nashville, TN 37210	9-19-05	Collector
H. E. Parmer Co., Inc.	1635 County Hospital Rd, Nashville, TN 37218	9-23-05	Collector
Waste Management, Southern Services Landfill	4561 Amy Lynn Drive, Nashville TN 37218	6-1-05	Operator
City of Goodlettsville	215 Cartwright Street, Goodlettsville, TN 37072	11-15-05	Collector
Crick Disposal, Inc.	2635 Hart Street, Nashville, TN 37207	9-21-05	Collector
Cordell Johnson	315 Hickory Street, Madison, TN 37116	10-30-05	Collector
Allied Waste Services	Not Provided	10-4-05	
Clarksville Disposal	714 Red River Street, Clarksville, TN 37040	9-19-05	Hauler
Olympic Disposal, INC.	148 Volunteer Drive, Hendersonville, TN 37075	9-16-05	Collector
Seventh Transport, Inc.	3620 Hwy 641 South, Camden, TN 38320	9-23-05	Hauler
PDQ Disposal, Inc.	625 Hamilton Avenue, Nashville, TN 37203	9-30-05	Collector
Burnice Winfrey Disposal, Inc.	1600 Emerald Drive, Nashville, TN 37128	9-29-05	Collector
Waste Industries, Inc.	7320 Centennial Blvd, Nashville, TN 37209	12-21-05	Collector
MLT Disposal	4571 Clarksville Hwy., Nashville, TN 37218	9-15-05	Collector
Sweeping Corp of America, Inc.	713 Mel Park Dr, Nashville, TN 37204	10-21-05	Hauler
BFI/AAA Transfer Station	7320 Centenial Blvd, Nashville, TN 37210	10-4-05	Operator
BFI/AAA Transfer Station	1160 Freightliner Drive, Nashville TN 37210	10-4-05	Operator
American Disposal Service, LLC	340 Rockland Road, Hendersonville, TN 37075	10-7-05	Collector

4.4.2 Future Direction of Element 4

Metro will continue routine inspections of all active and inactive municipally-owned or privately-owned landfills within Davidson County. Treatment, storage, and disposal facilities as well as solid waste haulers will continue to be monitored as necessary.

4.5 Use of Pesticides, Herbicides, Fertilizers, Oils, and Other Toxic Materials (Part III.B.5)

The objective of this section of the SWMP is to satisfy Part III.B.5 regarding the education of the public on the proper use, handling, storage, and disposal of pesticides, herbicides, fertilizers and other household hazardous wastes. This public education element is an ongoing effort.

4.5.1 Operate Household Hazardous Waste Facility (Part III.B.5.a.)

Contact Name: Jenna Smith-Sexter, Public Works Waste Management Division 615.862.8727

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
5a	Operate Household Hazardous Waste Facility	At least 1/quarter	•	•	•			

Metro's Public Works Division of Waste Management operates a household hazardous waste (HHW) facility. The HHW facility or East Recycling Convenience Center is located at 941 Richard Adams Road. The HHW facility is open to all residents of Nashville and Davidson County 361 days a year.

A full-time hazardous waste technician assists customers with unloading waste and then packages the material and finds receptacles for the collected material. Items accepted at the facility include newspaper, mixed paper, paper board, cardboard, aluminum, tin, glass containers, plastic bottles, tires, appliances, furniture, other bulk items, used oil, antifreeze, batteries, cleaners/solvents, insecticides, and lawn and pool chemicals. Items not accepted include tires, trash, ammunition, business and industrial waste, explosives/fireworks, medical waste, flares, smoke detectors, radioactive material, and gas cylinders. Commercial vehicles, rental trucks, and vans are not allowed at the site.

Information on hazardous waste is provided to the public on both the Public Works website and in an educational pamphlet to the right. The DWM's website is: http://www.nashville.gov/Recycle/. Information is provided on identifying hazardous wastes, finding alternatives to hazardous products, and disposing of waste properly.

4.5.2 Commercial Distributors (Part III.B.5.b.)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit Year Accomplished					Comments for PY3
			1	2	3	4	5	
5b	Commercial Distributors – Public Information	Ongoing	X	•	X			More effective education program adapted

During permit year 2, the NPDES program began an educational campaign directed toward commercial distributors, as well as landscaping companies who are involved in the application of such chemicals. Metro first obtained a list of Davidson County commercial distributors and landscaping companies through the yellow pages. Once a list was obtained, Metro created and sent a brochure detailing the proper chemical application methods and guidelines to each business on the list. A copy of this brochure is included in Appendix B. During permit year 3, the NPDES Department began to refocus efforts from educating the "commercial distributors" to educating the businesses that are applying the chemicals. The NPDES Department believes this effort to be more effective than educating distributors and wishes to modify this component of the permit.

4.5.3 Metro Facilities (Part III.B.5.c.)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
5c	Metro Facilities	Permit Year 2		•				

Metro recognizes the importance of preventing stormwater pollution from occurring on Metro properties. The Metropolitan Government of Nashville owns nearly 14,000 acres of land, making it one of the largest landowners in the County. While the majority of the Metro land is owned by the Parks Department and has been left in its natural wooded state, there are many other Metro properties that receive routine land maintenance activities. During permit year 2, the NPDES Department developed a campaign to educate all Metro departments that perform land maintenance activities. The NPDES Department continued to educate other Metro departments in permit year 3. On June 22, 2006, the NPDES Department held a MS4 permit seminar in which all heads of Metro departments were invited. Many Metro departments were represented at the meeting including: Planning Department, Public Works, MWS System Services, Mayor's Office, Nashville Electric Service, Health Department, Fire Department, Office of Fleet Maintenance, Codes Department, and Real Properties Services. The focus of the meeting was to educate other Metro departments on responsibilities of the MS4 permit. A large part of the meeting was devoted to the management of Metro properties and maintenance procedures and how they can impact water quality. As mentioned earlier in the document, the NPDES Department will initiate an Environmental Compliance Inspection program to ensure Metro properties and operations are not causing impacts to water quality.

In permit year 3, the Metro Office of Fleet Maintenance built and opened a new Metro fleet maintenance facility (Metro Southeast). This facility performs maintenance on all light vehicles and small equipment throughout Metro; maintenance that was previously performed at numerous facilities across the county. The Metro Southeast facility is completely indoors and there appears, upon NPDES inspection, to be no impacts to water quality.

4.5.4 Future Direction of Element 5

Operate Household Hazardous Waste Facility

The East Recycling Convenience Center (HHW facility) is anticipated to remain open 361 days a year to all residents of Davidson County.

Commercial Distributors

It is very difficult, if not impossible, to secure/maintain a list of commercial distributors. In addition, education efforts performed in the past have been ineffective. The NPDES Department intends to refocus the efforts within this permit requirement to educating the businesses that are applying the chemicals. In permit year 4, the NPDES Department will create a brochure to be distributed at Food Service Establishments that explains the impacts even biodegradable chemicals, can have on water quality. The NPDES Department wishes to modify this component of the SWMP to focus on the applicators. See Section 7 of this document.

Metro Facilities

The NPDES Department will continue its educational campaign to instruct all Metro departments on the proper handling and use of chemicals and hazardous substances. The NPDES Department will also implement the Environmental Compliance Inspection program that will be a resource for chemical storage and application practices at Metro properties.

4.6 Illicit Discharges and Improper Disposal (Part III.B.6)

This element is designed to meet Part III.B.6 by facilitating an ongoing program to detect and stop illicit discharges and improper disposal of wastewater or solid wastes into the municipal separate storm sewer system (MS4). Components of the ongoing program include inspections, ordinances, enforcement procedures, field screening and investigations, spill response procedures, public information, management and disposal of oil and toxic materials, and limiting sanitary sewer seepage.

4.6.1 Ordinances and Enforcement Measures (Part III.B.6.a)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
6a	Refine Ordinances and Enforcement Measures	PY 1 and PY 3	•		•			

Metro Nashville has a strong Code of Law that clearly defines illicit discharges. The NPDES Department has reviewed the regulations and the enforcement powers for illicit discharges and believes them to be adequate with no need of change. Metro Nashville's main Code of Law addressing illicit discharges is §15.64.205. Metro Code of Law can be found at the following link: http://www.nashville.gov/law/disclamer.htm

4.6.2 Dry Weather Field Screening (Part III.B.6.b)

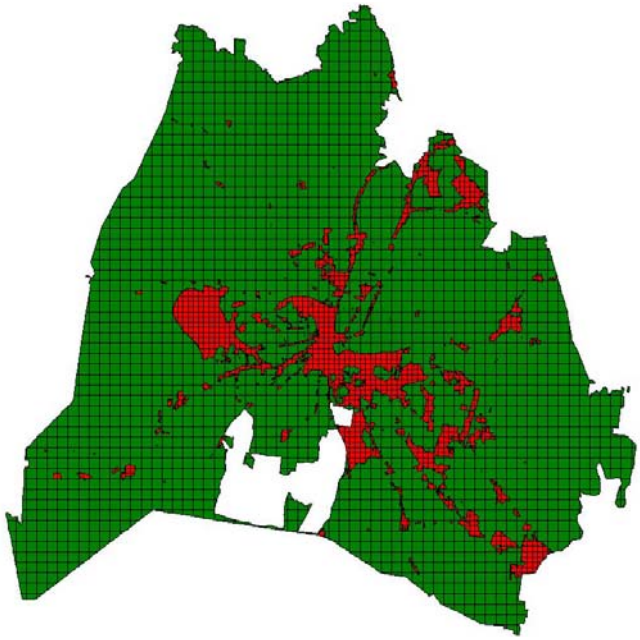
Contact Name: Mike Seremet, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
6b	Update and Prioritize Dry-Weather Field Screening	PY 5						

Metro made a significant effort in the first permit cycle in dry weather field screening, inspecting 4,274 sites. For the second permit cycle, revised dry-weather field screening procedures were adopted so as to maximize the effectiveness and efficiency of field screening efforts. Field screening in a predominantly residential or agricultural land use, as required by our permit, found very few, if any, illicit discharges during the first permit cycle. Therefore, dry-weather field screening is now focused more on non-residential land uses during this second permit cycle. Any needed illicit discharge identifications and reporting in residential or agricultural areas will be conducted in response to citizen complaints.

Field screening during the second permit cycle is conducted in non-residential zoned areas using a ¼ mile grid. The ¼ mile grid has been created from updated GIS-based land use/zoning data, developed by the Metro Planning Commission, to guide and monitor dry-weather field screening activities (See Figure 4.6.2.1). Field screening was conducted during permit year 3 and will continue through future permit years until all non-residential areas are adequately screened. Once completed, nearly 2,000 separate outfalls will have been screened for illicit discharges. Illicit discharges to the MS4 found during this screening process will be investigated and rectified.

Figure 4.6.2.1 Field Screening Grid



Non-residential areas are designated in Red.

4.6.3 Illicit Discharge Investigations (Part III.B.6.c)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

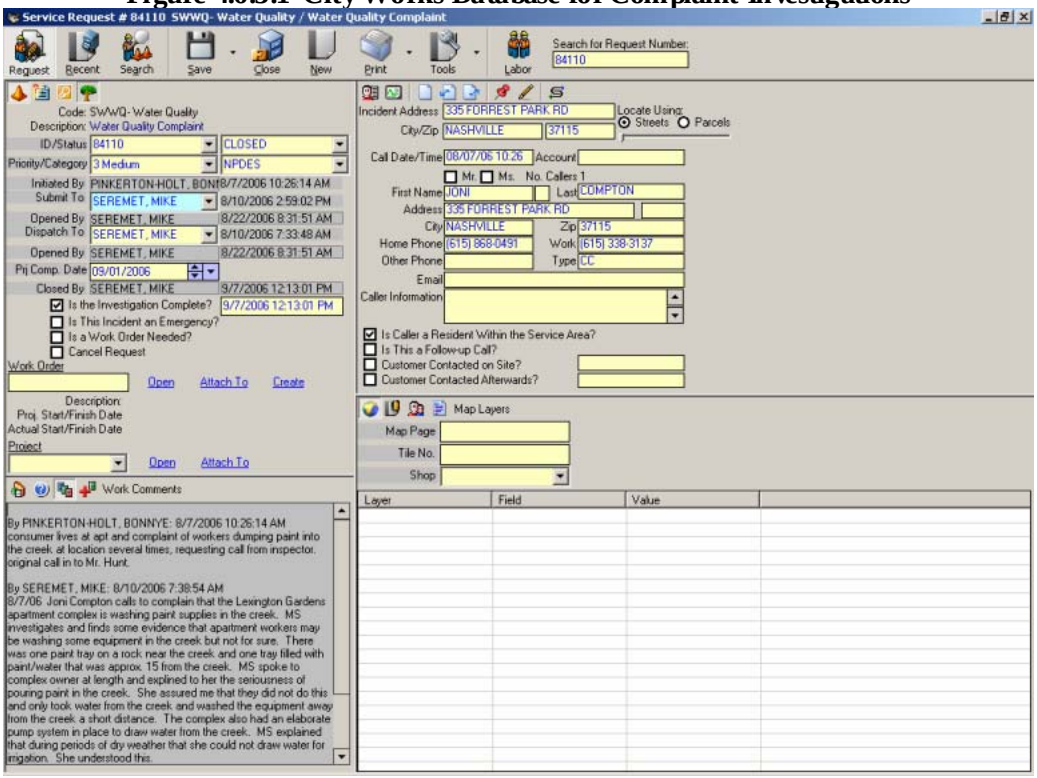
Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
6c	Illicit Discharge Investigations	Ongoing	•	•	•			

MWS has a comprehensive illicit discharge investigation program in place. Illicit discharges are detected through a variety of methods that include field screening, citizen complaints, thermograph investigations, and staff observations. Once a potential illicit discharge is detected, a comprehensive investigation is initiated and tracked. All illicit discharge investigations are treated as water quality complaints and are logged into databases that track the investigation status. During permit year 2, NPDES began a transition from an internal database within the NPDES office to a Metro-wide database (KIVA). In permit year 3, the NPDES Department realized that the KIVA database was not going to meet the needs for complaint investigation tracking, therefore, began using the City Works database. Any water quality complaint, spill/overflow response calls, and/or construction complaint of non-grading permit sites are logged into the City Works Database for investigation documentation. Figure 4.6.3.1 is a screen capture of the new City Works database. The database works within a GIS program that allows the user to map the location of a complaint if a valid address is available.

Illicit discharge investigations for the first few months of permit year 3 were tracked in the KIVA system, while investigations for the remaining part of the permit year were tracked in the City Works database. For purposes of reporting illicit discharge investigations in this document, there were approximately 287 complaint investigations tracked

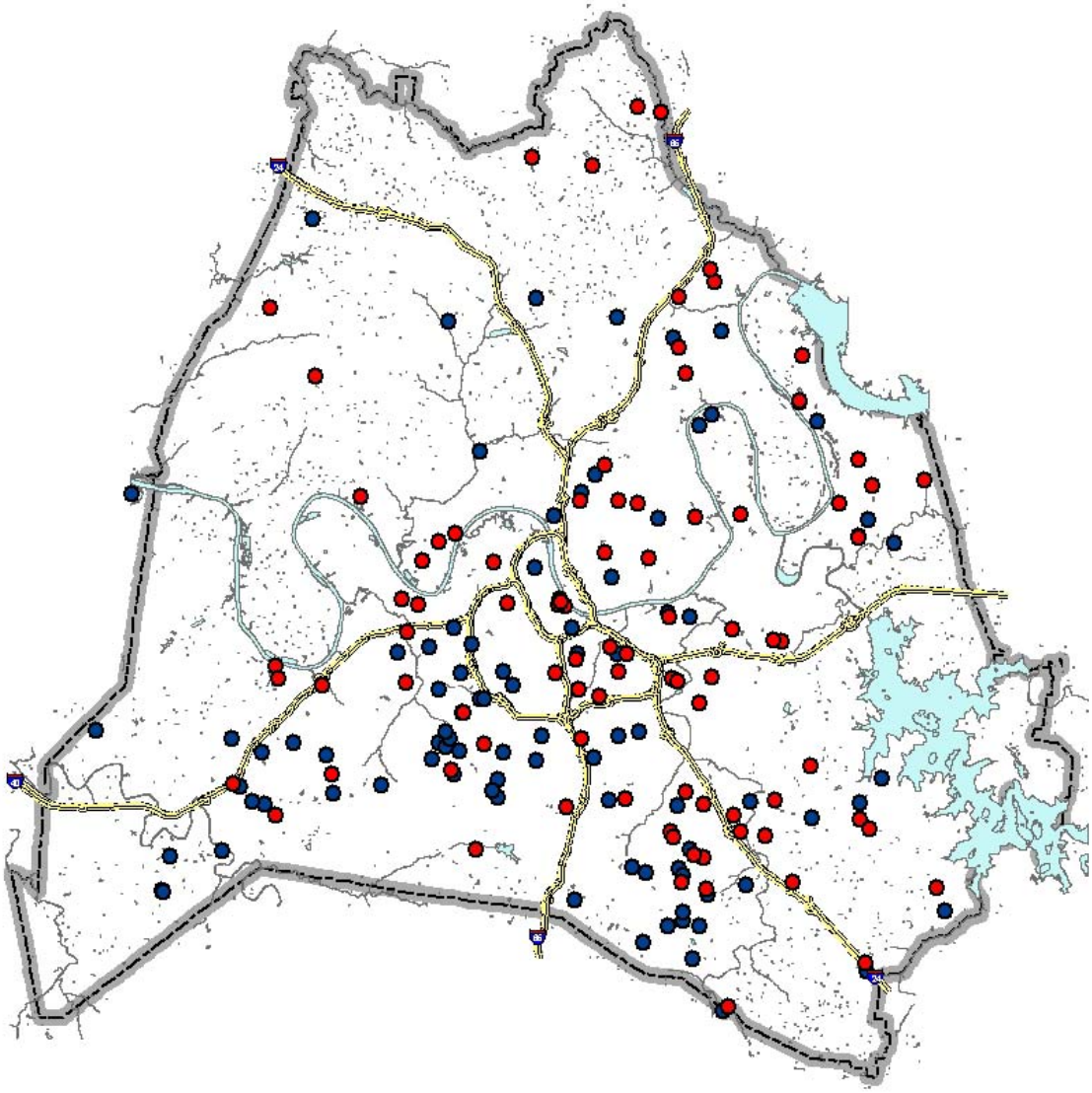
in the City Works database during permit year 3. Of the 287 complaints tracked in the City Works database, 123 of them were related to construction activities that were without a grading permit, 117 were considered general water quality complaints, and 47 were spill or sanitary overflow response.

Figure 4.6.3.1 City Works Database for Complaint Investigations



In permit year 2, the NPDES Department began to analyze illicit discharge (water quality complaint) investigations to determine if any trends were present that could affect policy decisions on public education, enforcement, etc. The NPDES Department continued this effort in permit year 3. Figure 4.6.3.2 illustrates the geographical distribution of water quality investigations that were initiated during the last permit year. Table 4.6.3.1 breaks down permit year 3 water quality investigations by watershed.

Figure 4.6.3.2 Geographical Distribution of Complaints for Permit Year 3



- Water Quality Investigations
- Construction-Related Investigations

Table 4.6.3.1 Permit Year 2 Water Quality Investigations per Watershed

Watershed Name	Number of Investigated Complaints in Permit Year 2	Number of Investigated Complaints in Permit Year 3
Mill Creek	44	35
Browns Creek	31	17
Sevenmile Creek	16	9
Stones Creek	14	13
Combinded Sewer Overflow	13	16
Cumberland River	12	18
Richland Creek	12	18
Sugartree Creek	12	8
Harpeth River	10	10
Whites Creek	8	2
Ewing Creek	7	2
Pages Branch Creek	6	5
Gizzard Branch	2	0
Sulphur Creek	2	0
Cooper Creek	0	3
Sycamore Creek	2	1
Dry Creek	1	4
Gibson Creek	1	2
Indian Creek	1	0
Loves Branch	1	0
Manskers Creek	1	4
Overall Creek	1	3
Sandy Creek	1	0

Note: For purposes of this document spills and overflow responses were not mapped to the watershed. Some of the addresses of the complaints could not be mapped in GIS for watershed analysis.

The ultimate goal of an illicit discharge investigation is to eliminate pollution. The process of achieving corrective action is different for each scenario and is handled on a case by case basis. Upon discovery of an accidental illicit discharge, MWS NPDES Department contacts the discharger to resolve the issue. If the discharge is considered a recurring or negligent event and depending of the type of discharge, the TDEC Division of Water Pollution Control will be notified. The illicit discharge investigations involve sampling and other water quality field tests depending on the type and severity of the discharge. In some cases, sampling becomes very important in documentation of illicit discharges, especially in cases that involve enforcement. Whenever possible, the NPDES Department attempts to use public education to achieve compliance, however, in some cases, enforcement is necessary.

4.6.4 Public Information in Residential/Commercial Areas (Part III.B.6.d)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
6d	Distribute Public Information to Residential/Commercial Areas	Ongoing	•	•	•			

Public information activities associated with illicit discharges and improper disposals in residential and commercial areas are detailed in Section 4.10.1.

4.6.5 Sanitary Sewer Seepage (Part III.B.6.e)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
6e	Evaluate Reporting for Sanitary Sewer Seepage	PY 1 and PY 3	•		•			

The NPDES Department periodically evaluates the protocols for reporting potential sanitary sewer seepage into the MS4 or "Waters of the State". NPDES staff participates in monthly Overflow Abatement Program (OAP) meetings to discuss current investigations related to possible sewage seeps and proposed courses of action. The Overflow Abatement Program is an on-going effort to improve the water quality of the Cumberland River and its tributaries in Middle Tennessee. Significant progress has been made over the last decade in the reduction of combined sewer overflows (CSO) and sanitary sewer overflow (SSO) points.

Rehabilitation and replacement of defective sanitary sewer lines has been an integral part of Metro Water Services' Overflow Abatement Program since it's inception in 1990. Many of the programs are designed to increase the capacity to transmit and treat sanitary flow, which was reduced due to deterioration and leakage of both storm water and ground water into the sewer lines. Capacity increasing projects include installation of parallel sewer lines, upsizing pumping stations, installation of inflow equalization basins and treatment plant expansions, and rehabilitating or replacing lines. Flows are actually reduced with rehabilitation to normal design levels, particularly during wet weather events due to the exclusion of stormwater infiltration. Eliminating hydraulic overloading brought about by inflow and infiltration reduces overflows and bypasses of wastewater from the collection system, thereby improving the quality of stream water in our community.

MWS spent approximately 9.2 million dollars on the rehabilitation of approximately 18.1 miles of sewer lines during permit year 3. In addition, during permit year 3, approximately 4.24 million dollars were spent on the improvements to the Dodson Chapel Equalization Basin and Pump Station in the Stoners Creek watershed and approximately 2.3 million dollars were spent on the Smith Springs Equalization Basin in the Mill Creek watershed. Information on OAP is also available to the public at the following website: www.nashvilleoap.com/home.html.

Focus was also given in permit year 3 to proper remediation of sanitary seeps or overflows once discovered. As mentioned in Section 4.1.5, the NPDES office and MWS System Services worked together to develop a Standard Operating Procedure (SOP) to remediate sanitary sewer spills, overflows, and/or seeps. During permit year 3, the NPDES Department responded to numerous sanitary sewer overflows and provided technical guidance on proper remediation.

Sanitary sewer seeps are identified through the OAP ambient monitoring program, citizen complaints, and the MWS thermograph investigation program. The thermograph investigation enables staff to identify leaking sanitary sewers and other illicit discharges based on elevated temperatures of illicit flows compared to ambient stream temperatures. The thermography study with cooperation from the Police Department was expanded from four creeks in 2003 to ten creeks in 2004 and includes Richland, Mill, Sevenmile, Manskers, Pages, McCrory, Gibson, Stoners, Browns, and the Stones River. Unfortunately, during the winter of 2005, the NPDES Department was unable to conduct the aerial infrared or "thermography" sewer and stormwater line inspection. The camera in the police helicopter was being repaired and was unavailable for NPDES use during the period Thermography has to be done (winter, during cold weather when leaves are off the trees). The NPDES intends to conduct the thermograph investigation during permit year 4.

The NPDES Department initiated a watershed water quality program in permit year 3 aimed at improving water quality by increasing public awareness of water quality issues, developing and coordinating partnership resources, and increasing stream monitoring and illicit discharge detection efforts. The initial phase of this program was to gather as much data as possible, which included physically walking streams from mouth to headwaters, sampling and documenting issues that may have caused streams to be placed on the 303(d) list initially. During the stream walk NPDES staff members collect a sample at every tributary or inflow of water into the creek. The NPDES staff also collects background samples of the main stem of the creek in intervals throughout the walk. Some of the water quality parameters sampled for include fecal coliform, *E. coli*, chlorine, conductivity, dissolved oxygen, pH, and temperature. If while conducting the stream walk, unusual sampling results or observations are found in the field, NPDES staff will follow the discharge upstream in an effort to identify the source. In some cases source identification may be difficult and involve the initiation of a comprehensive illicit discharge investigation.

The NPDES Department uses a GPS unit to collect data in the field. Once back in the office, these data are transferred into a GIS database. While the steam walk program's main focus is to find sanitary sewer seeps/leaks or illicit discharges, the NPDES Department, also collects data of impacted areas along the creek. For example, GPS points are collected along segments of the stream that are without a riparian buffer, are suffering from severe bank erosion, have large amounts of trash within and around the stream, and have homeless camps along the banks. The watershed manager, Dr. Steve Winesett, intends to compile this data on all of the impaired streams so that future improvement/education projects can be coordinated as needed.

In addition to the stream walks, the watershed water quality program initiated in permit year 3 will also research the impacts of septic system failures. At the end of permit year 3, the NPDES Department obtained a list of reported septic system failures to determine if any trends are present that might explain elevated bacterial levels in creeks. Table 4.6.5.1 is a list of watersheds where septic system failures were reported in permit year 3. Figure 4.6.5.1 illustrates the locations of the reported septic system failures in permit year 3.

Figure 4.6.5.1 Locations of Septic System Failures in Permit Year 3

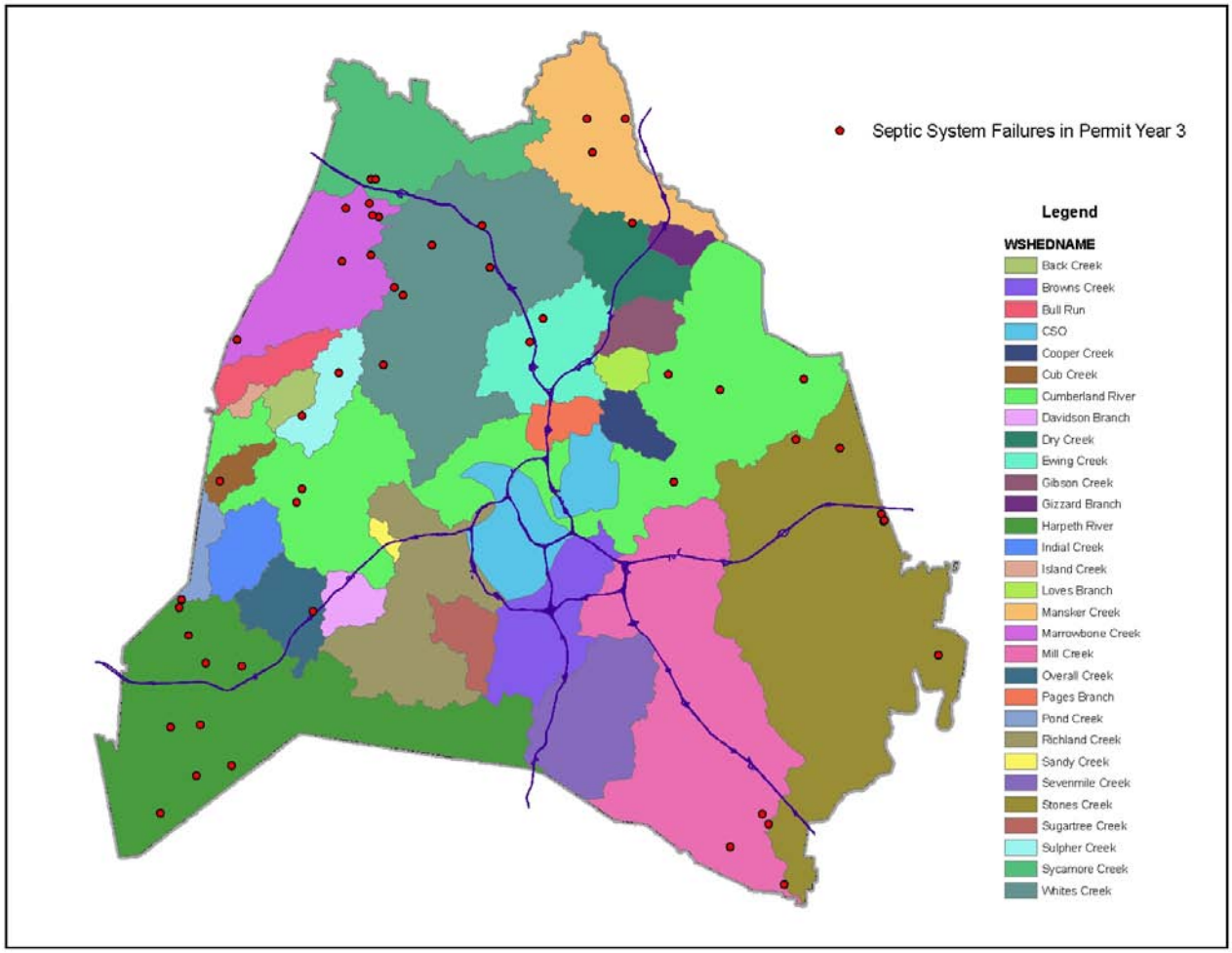


Table 4.6.5.1 Watersheds with Septic System Failures in Permit Year 3

Watershed Name	Number of Reported Failures
Harpeth River	9
Marrowbone Creek	7
Whites Creek	6
Cumberland River	6
Stones River	5
Mill Creek	4
Manskers Creek	4
Ewing	2
Sycamore	2
Sulphur Creek	2
Pond Creek	1
Overall Creek	1
Cub Creek	1

4.6.6 Future Direction of Element 6 – Illicit Discharges and Improper Disposal

Ordinances and Enforcement Measures
MWS will continue to review the ordinance and enforcement measures for effectiveness.

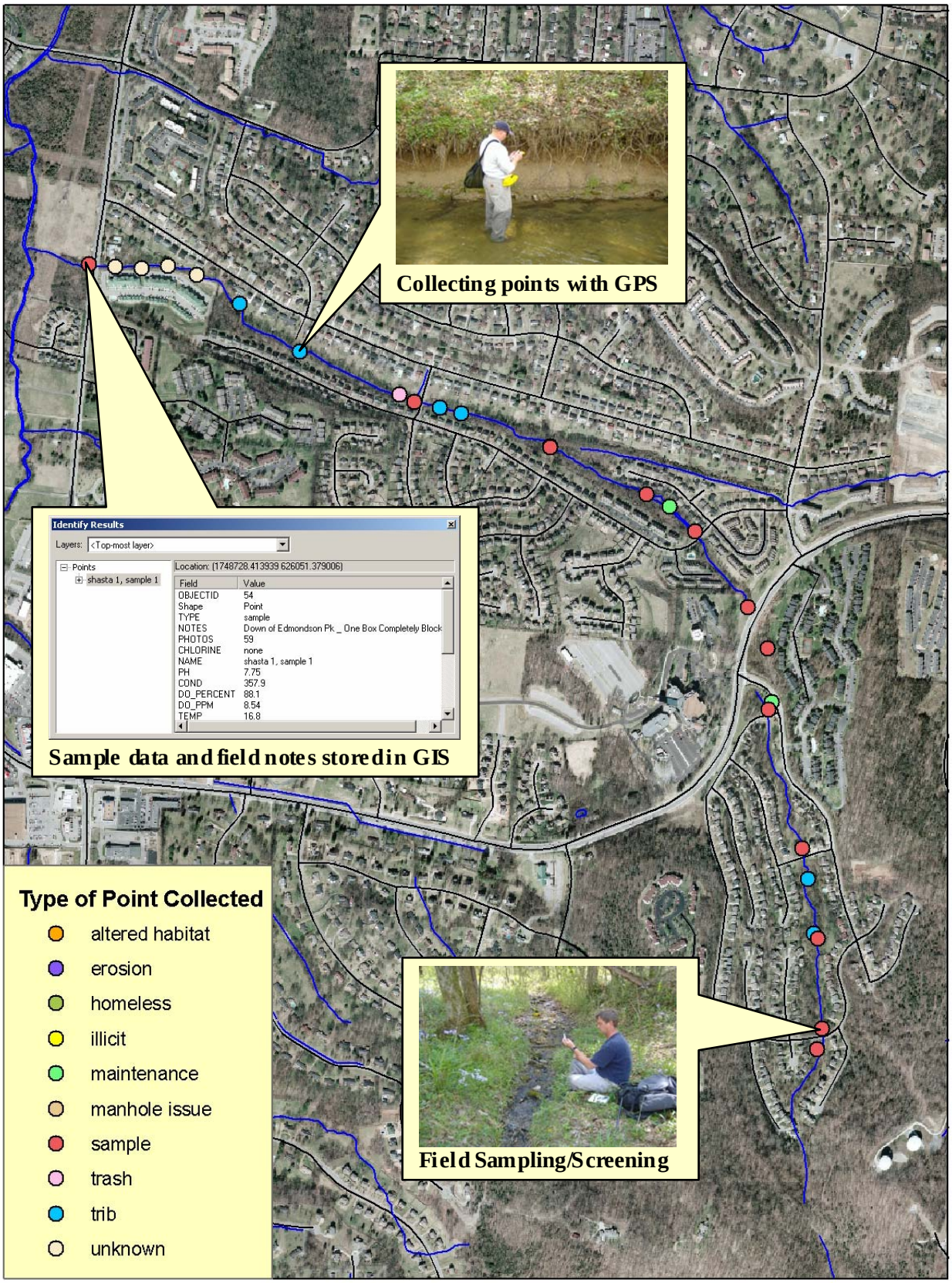
Dry-weather Field Screening
Field screening will continue to be conducted within land uses that are predominantly non-residential, using the newly developed ¼ mile grid. Field screening in residential areas will occur as citizen complaints arise.

Illicit Discharge Investigations
The illicit discharge investigation program is an ongoing program to identify discharge sources, educate responsible parties, and implement enforcement measures as appropriate. The program will continue through the second permit cycle with modifications to the investigation procedures as technology develops.

Public Information in Residential/Commercial Areas
Public information activities associated with illicit discharges and improper disposal in residential and commercial areas are presented in Section 4.10.1.

Sanitary Sewer Seepage
Metro will continue to evaluate protocols for reporting potential sanitary sewer seepage into the MS4 and/or "Waters of the State". NPDES staff will work more closely with the System Services Department on proper remediation of sanitary sewer spills and overflows. In addition, MWS will use lessons learned from the 2004 aerial infrared flight to improve the process of identifying leaks and illicit discharges by making it more efficient, more routine, expanding the scope of flights, and creating quicker responses to illicit discharges. Many of the springs and seeps identified in previous thermograph investigations will not require future sampling/investigation, therefore, allowing more time to be spent on other thermal anomalies.

Figure 4.6.5.2 Example Segment of Stream Walked



4.7 Industrial and High Risk Runoff (Part III.B.7)

The objective of this element is to satisfy Part III.B.7 of the permit, which requires Metro to minimize the impact of high-risk stormwater runoff from industrial facilities, municipal facilities and restaurants. This objective is to be accomplished through inspecting industrial sites, landfill and waste disposal facilities, transfer and storage facilities, researching problems associated with restaurant stormwater runoff, and monitoring selected industries.

4.7.1 Data Management (Part III.B.7.a)

Contact Name: Josh Hayes, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
7a	Data Management – Update Industrial Site Databases	Annually	●	●	●			

Metro is required to monitor and control pollutant runoff from the following types of industries and activities:

- Municipal landfills (see Section 4.4 of this report);
- Hazardous waste treatment, storage and disposal facilities (see Section 4.4 of this report);
- Industries subject to SARA Title III Section 313; and
- Industrial facilities that the municipal permit applicant determines are contributing a substantial loading of pollutants to the municipal storm sewer system.

The database for tracking industrial inspections of these facilities was created during permit year 1. In the beginning of permit year 2, the NPDES office emailed a copy of the database to TDEC-Division of Water Pollution Control for review. The database has been updated in each permit year to reflect updates to the Environmental Protection Agency (EPA) Envirofacts website. In addition, several industrial facilities were added to the inspection list as the office deemed necessary by the NPDES office.

4.7.2 Inspections (Part III.B.7.b)

Contact Name: Josh Hayes, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
7b	Inspections	---						
	Refine Procedures/Criteria to Prioritize Sites	PY 1, PY 3, and PY 5	●					
	Train Inspectors	PY 2 and PY 4		●				
	Inspect Facilities	Once by PY 5	●	●	●			Ongoing
	Coordinate Inspection and Enforcement Activities with TDEC Staff	Ongoing	●	●	●			
	Report Inspection Locations	Ongoing	●	●	●			

On August 3, 2004, NPDES staff met with TDEC personnel to discuss industrial stormwater inspection procedures and necessary coordination between the two agencies. It was determined that the NPDES Department would continue inspections of industrial facilities regardless of the facility's state permit status and that follow-up documentation would be provided to TDEC for each site.

Refine Procedures/Criteria to Prioritize Sites
During the first and second permit year, inspection prioritization was given to those sites the NPDES office had previous involvement with pollutant runoff, facilities located in direct proximity of water bodies, and sites discovered to have pollutant runoff through field screening and/or complaint investigations. In the third permit year, inspection prioritization was given to facilities TDEC listed as "priority 1" on their industrial inspection database. In permit year 4, the NPDES Department will take a watershed approach to prioritizing industrial inspections. The list of industrial site prioritization is included in Appendix A.

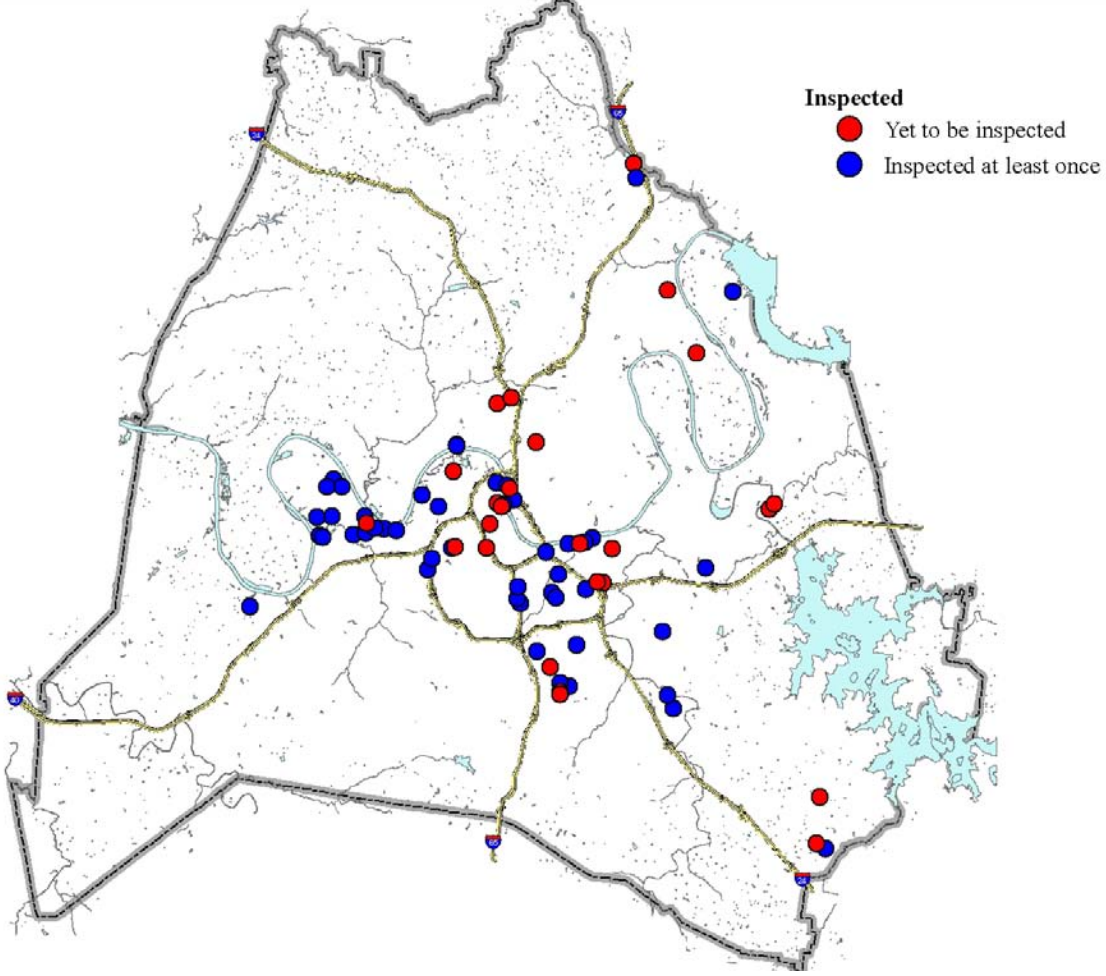
Train Inspectors
In permit year 1, NPDES staff attended industrial inspection training in Memphis that was sponsored by the University of Tennessee. During permit year 2, NPDES staff sought additional training by observing an industrial inspection performed by TDEC staff. Currently, there are three inspectors in the NPDES program that are trained in the proper industrial stormwater inspection procedures. The NPDES staff will continue to look for training opportunities for industrial inspection staff.

Inspect Facilities
The NPDES office inspected 16 industrial facilities during permit year 3. In addition, the NPDES office performed numerous follow-up inspections of sites originally inspected in earlier permit years. The inspections have resulted in the discovery of numerous stormwater violations. The inspections also yielded the discovery of several facilities lacking appropriate State stormwater permit coverage. Inspection result letters were sent to each of the facilities outlining specific site remediation required by the NPDES office. Most of the facilities, with the exception of a few, have performed the required site remediation to correct stormwater runoff violations. At the end of permit year 3, there were 34 industrial facilities on the list that have yet to be inspected by the NPDES program. The NPDES office will attempt to inspect all of the remaining industrial facilities in permit year 4, so that permit year 5 could be utilized to follow-up with problem sites. A list of all of the industrial sites within the NPDES database and their inspection status is included in Appendix A.

Coordinate Inspection and Enforcement Activities with TDEC Staff
As mentioned above, the NPDES program and TDEC made an effort to coordinate inspections on industrial facilities, but it was decided that NPDES would perform inspections independent of TDEC, unless extraneous circumstances were encountered that required coordination. The NPDES program coordinates all enforcement/follow-up activities with TDEC by copying them on all correspondence relating to industrial inspections.

Report Inspection Locations
At the end of permit year 3, the NPDES office sent the permit year 4 prioritization list to TDEC. The NPDES Department will continue to report industrial inspection locations and findings.

Figure 4.7.2.1 Industrial Sites Inspected as of the end of Permit Year 3



4.7.3 Restaurant Impacts (Part III.B.7.c)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420
Hugh Garrison, MWS Operations Division - FOG, 615.862.4590

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
7c	Restaurant Impacts – Report activities that reduce water quality impacts	Annually	•	•	•			

MWS has a focused grease management program known as the Fats, Oils, and Grease (FOG) Program to address overflows and blockages of the sanitary sewer system caused by improper disposal of these substances. Overflow or backflow discharges caused by blockages affect ambient water quality. The objectives of this program include:

1. Operation and Maintenance cost reduction,
2. Collection system improvement,

3. Policy development on grease control equipment, and
4. Better tracking of collection system maintenance responses.

The FOG program issues permits to Food Services Establishments (FSE) including restaurants, schools, prisons, entertainment venues, and other food-servicing programs. Through cooperation with and participation by the Metro Health Department, the FOG staff and subcontractor staff, the goal is to inspect every restaurant within Davidson County annually. During permit year 3, approximately 1,115 Food Service Establishments (FSE) were inspected through the FOG program. There were approximately 213 Notices of Noncompliance and 8 Notices of Violations issued during permit year 3. Approximately 107 of the site deficiencies were noted as having a potential to impact stormwater. In permit year 3, there were 3 MWS sanitary overflows and 3 private property overflows directly contributed to fats, oils, and grease.

The permit program requires FSEs to have their (Grease Control Equipment) GCE certified annually. A copy of the grease interceptor/trap certification form is included in Appendix A. In an attempt to improve maintenance of GCE, the MWS FOG program created a "Grease Interceptor Maintenance Guide" that is distributed to FSEs. A copy of the English and Spanish versions of the guide is included in Appendix B. Items examined during the certification process includes that no holes are present causing the leaking of grease into the restaurant or the ground, baffles are in place, tees are present on inlet and outlet of grease interceptors, and access to each chamber of the grease interceptor is provided for proper maintenance/inspection.

A copy of a field inspection sheet is depicted in Figure 4.7.3.1. In subsequent investigations, grease found on walls of the trap results in the issuance of a warning, and grease found in the sanitary sewer results in a Notice of Violation (NOV), a copy of which can be found in Figure 4.7.3.2.

NPDES Department staff also investigates various restaurant-related complaints as part of its illicit discharge investigation program. See Section 4.6 for more information on Metro's illicit discharge detection and elimination program.

Efforts were made in previous years to establish permit requirements for the subject establishments that occasionally have water quality impact issues. A policy is now included in regulations for Mobile Food Units that states "No material (solid or liquid waste) shall be discharged to the MS4 (or to a locale where such material may be washed via stormwater runoff into the MS4) as it relates to the operation of a mobile food unit per Metro 15.64.205."

4.7.4 Future Direction of Element 7 – Industrial and High Risk Runoff

Data Management

The industrial inspection database will be routinely updated in future permit years to include inspection results, site follow-up/remediation, and the EPA updates to the SARA Title III, Section 313 sites.

Inspections

Metro proposes that it will periodically refine procedures to prioritize sites for inspection based on SIC code, State industrial stormwater data, and other pertinent information. Inspections for all of the industrial sites on the list will continue over future permit years. NPDES will continue to coordinate all inspection results and enforcement actions with TDEC. At the end of each permit year, NPDES will provide a map to TDEC depicting the locations and inspection status of industrial sites and a list of industrial sites that will be inspected in the following permit year.

Restaurant Impacts

Through the FOG program and in coordination with its subcontractors and the Health Department, MWS plans to inspect every FSE each year. Inspection priority will be based on emergencies and hotspots, while program emphasis will be placed on continued education and enforcement. FOG plans to continue partnerships with the Metro Health Department, the Fire Marshall's Office, Codes Department, and the Department of Education with hopes to develop relationships with other Metro entities in the future. In addition, the NPDES program intends, over the next permit year, to begin educating (through enforcement and brochures) various restaurants on proper disposal of mop wash water and other waste.

Figure 4.7.3.1 FSE Grease Control Inspection Form

FOOD SERVICE ESTABLISHMENT GREASE CONTROL INSPECTION FORM

Facility Name: _____ **Inspection Date:** _____

Facility Representative: Mr. / Ms. _____ **Title:** _____

Phone: _____ **Owner/Regional Manager Name:** _____

Facility Address: _____ Mail Address: _____ (if different)

Handy Map ID: _____ **Sewer Plat ID:** _____ **GPS ID:** _____

1. **Grease Interceptor**? ____ Yes ____ No *(For #1, if "NO" then go to # 14)*

2. Interceptor Size(gallons) __500 __750 __1000 __1500 __2000 __ 3000 ___Two Interceptors in series other:_____

3. Manhole Access to Interceptor:__1 __2 __3 __4

4. Estimated Grease Layer Depth:_____

5. Effluent T visible? ____Yes ___No (inspector can see the T)

6. Effluent T attached & in good condition: __Yes __No __ Unknown

7. Grease Interceptor Hauler used: _____

9.Bacteria/Enzymes used:___Yes___No Product Name:_____

10. Frequency Interceptor Cleaned? _____

11. Complete Contents Pumped? ____Yes ___ No

12.Records of Maintenance/Cleaning Available? Yes No

13. Last date cleaned: _____

Grease Trap

14. **Grease Trap**? __ Yes __ No *(For # 14, if "NO" then go to #20)*

15. Location: ___ Under sink trap ___ Floor trap ___ Outside "floor" trap

16. *Grease Trap flow-through rating / grease capacity Estimate:* __ 5 gpm/ 10 lb __ 10 gpm/ 20 lb __15gpm/30lb ___ 20 gpm / 40 lb ___ 35 gpm / 70 lb ___50 gpm / 100 lb ___ Other:_____

17. Frequency Trap is cleaned:_____. **18. Maintenance/Cleaning Records:** ____ Yes ____ No

19. Grease Trap comments/location disposed of waste:

BMPs & outside conditions, other than grease interceptor or trap

20. Best Management Practices Implemented ___Yes ___No

21. Grease Recycle Bin ___Yes ___No

22. Cleanout Covers missing or damaged? ___Yes ___No (# Cleanout covers missing: _____ damaged: _____) (Facility needs to repair missing or damaged cleanout covers immediately)

23. FOG impact at dumpster or around recycle bin? ___Yes ___No (if Yes give explanation below)

24. DOWNSTREAM MANHOLE: ___ Evidence of Grease in Manhole (__slight __moderate __ heavy)

Comments: _____

25. **SAMPLE POINT** Access? __ Yes __No Effluent Temp: _____ Effluent pH: _____

26. Sample point ID: ___Interceptor Effluent T ___Downstream MH ___Cleanout ___Sample drop box

27. Picture ID:_____ // ____ of Interceptor ____ of downstream MH ____other:_____

Visual inspection results, comments: _____

Inspector Name: _____ Signature: _____

Facility Representative Signature: _____

Inspection form copy provided to facility? ____Yes

Figure 4.7.3.2 FOG Notice of Violation

Department of Water & Sewerage Services, Environmental Compliance
Noncompliance Notification

DATE ISSUED:_____ Issued by:_____ DATE RESPONSE DUE:_____

Facility:_____ Address:_____
The following marked box(es)☒ indicate deficiencies or areas of concern that need to be addressed.

☐ Grease Interceptor Effluent T not attached or not acceptable, allowing fats, oils and grease to be discharged. *(replace effluent T and make sure length of T is adequate, to within 18" of bottom of interceptor tank).*

☐ Grease Interceptor Effluent T not visible or accessible for inspection. *(need to verify during pumping of interceptor if effluent T is attached and in good condition, or will have to take action to install access opening over effluent T to ensure it is attached to prevent fats, oils and grease from being discharge. Also you need access to outlet compartment so it can be cleaned properly).*

☐ Grease Interceptor mid baffle wall or side walls indicates deterioration of concrete. *(inspect grease interceptor at the time the grease interceptor is completely pumped, check to ensure deterioration of concrete is not going to cause the mid baffle wall or outside walls to collapse or cause tank contents to leak out of the interceptor. Normally, the concrete thickness on most interceptors is 4", it is recommended that if deterioration of concrete is greater than 50% then the interceptor needs to be repaired or replaced.)*

☐ Grease Interceptor fats, oils and grease layer and food solids layer are greater than 25% of the capacity of the interceptor tank. *(interceptor needs to be pumped immediately, provide record of pumping to Metro; get interceptor on regular schedule to be pumped, minimum of every 3 months but some larger facilities may have to pump monthly to ensure grease does not cause problems).*

☐ Fats, oils and grease evident in downstream manhole from facility, immediate action needs to be taken. *(this could include installing new grease interceptor, controlling flows through the interceptor to prevent washout of grease to the sewer, implementing strict BMPs for all personnel to control grease discharges or other action)*

☐ Facility has no grease control equipment installed. *(if large facility you will need to install an appropriate sized interceptor or trap, refer to Metro Water Services' brochure on minimum size of grease control equipment).*

☐ No Records of interceptor or trap maintenance available at the facility for inspection review. *(keep copy of all grease waste hauler manifests and records at the facility location, if the traps are cleaned by facility personnel then keep written record onsite of cleaning date, person doing cleaning and location the grease and food waste was disposed)*

☐ Sewer cleanout covers need to be replaced, allowing rainfall inflow to sewer system.

☐ Fats, oils and grease on ground around recycle bin or dumpster, causing stormwater impact.
RESPONSE FROM FACILITY (attach additional information if necessary): Mail Response to:
Metro Water Services, ATTN: FOG Program, 1607 County Hospital Rd., Nashville, TN 37218
Facility Contact Name furnishing response:_____Title:_____
(White copy: Metro; Yellow Copy: Facility to submit with response; Pink Copy: For Facility's records)

4.8 Construction Site Runoff (Part III.B.8)

This section of the program is designed to satisfy Part III.B.8 of the permit, which is intended to limit the impact of stormwater runoff from construction sites through the establishment of procedures enforced through ordinances for site planning. The procedures will be implemented by plan reviewers, inspectors, as well as through an extensive public education program.

4.8.1 Ordinances, Regulations, and Guidance (Part III.B.8.a)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
8a	Ordinances, Regulations, and Guidance	---						
	Enforce existing ordinances and regulations	Ongoing	●	●	●			
	Refine procedures to enhance enforcement	PY 1 and PY 3	●		●			
	Evaluate and Update guidance materials	PY 1 and PY 3	●		●			
	Public Education	Ongoing	●	●	●			
	Require proof of coverage under the state's construction general permit	Ongoing	●	●	●			

Metro took significant steps in the first and second permit year to enhance local regulatory mechanisms designed to improve water quality by beginning to revise the Stormwater Management Manual. During permit year 1, MWS focused on identifying inadequacies in the stormwater regulations. Throughout the second permit year, MWS underwent an extensive regulations revision process that involved numerous meetings and discussions with stakeholder groups that consisted of members from Metro Council, the Metro Stormwater Management Committee, the development and engineering community, state and local organizations, and the general public.

In permit year 3, Metro conducted a training session with the staff and the development community on key program changes that will take place when the new regulations go into effect. Given the importance of the regulations to be as up to date as possible, the NPDES Department has devoted a staff member to continually search for opportunities to revise the stormwater regulations. In addition, NPDES staff members meet periodically to discuss site inspection and enforcement experiences. These meetings allow staff opportunities to refine inspection procedures and enforcement mechanisms.

Metro recognizes the importance of having a sound public education program in preventing polluted construction site runoff. During permit year 3, NPDES continued public education geared toward construction site run-off. The NPDES Department employs many different techniques to get its message about construction site runoff out to the general public. One particular method continued in permit year 3 was the distribution of the "Demolition BMP Reference Guide" when sites obtain building permits. Since many smaller construction sites not requiring a grading permit begin with a demolition phase that can be equally impacting to water quality, the NPDES Department realized public education on pollutant runoff prevention was needed in this area. A copy of the demolition guide can be found in Appendix B. There are many other areas of the NPDES public education program that address construction site runoff. The public education program is explained in further detail in Section 4.10.

Metro currently requires grading permit applicants to submit a copy of their Notice of Coverage (NOC) for a Tennessee Construction General Permit (CGP) prior to receiving approval for grading plans. This policy insures that a permittee is

aware of the CGP requirement. In addition, MWS plan review engineers require all other applicable State and Federal permits, such as State Aquatic Resource Alteration Permits (ARAP) and U.S. Army Corps of Engineers Section 404 Permits, to be obtained prior to plan approval.

4.8.2 Training (Part III.B.8.b)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
8b	Train Plans Reviewers and Inspectors	Annually	•	•	•			

MWS recognizes the importance of seeking technical training for stormwater plan reviewers and inspectors. As mentioned earlier, the NPDES Department conducted a training session with the Plan Review Section on the revisions to the Stormwater Management Manual. Refer to Section 2.5 for the training received by MWS stormwater staff in permit year 3.

4.8.3 Records Management (Part III.B.8.c)
Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
8c	Records Management - EP&SC inspections	Ongoing	•	•	•			

The MWS NPDES Department records inspections and enforcement activities for construction sites in a local database. Tallies for inspections are updated monthly. In permit year 3, NPDES staff conducted over 5,000 construction site inspections, which averages to over 400 inspections each month (see Table 4.8.3.1). During permit year 3, the NPDES Department was divided into two segments: "Construction Site Inspection Program" and "Water Quality Program". The "Construction Site Inspection Program" staff began performing and tracking both infrastructure inspection and Erosion Prevention and Sediment Control (EPSC) inspections in permit year 3. Previously, each construction site had two separate inspectors; one that inspected for EPSC issues and one that inspected for infrastructure installation. By combining the inspection efforts, the NPDES office has become more efficient in water quality and construction inspection. In permit year 3, the inspection numbers of construction sites for EPSC issues nearly doubled from the previous permit year.

Table 4.8.3.1 Annual Compliance Inspection Tally

	Michael Hunt	Steve Wall	Mike Seremet	Rebecca Dohn	Ann Motbitt	Silas Mathis	Valerie Williams	Josh Hayes	Dale Binder	Sonia Harvat	Kimberly Moore	Dr. Steve Winesett	Jim Whitsitt	Harold Bryant	Bob Vaught/Tom Mauck	Tim Mathis	Shawn Herman	TOTAL
Total FY02	8	57	103	0	0	0	0	0	0	46	0	0	0	0	0	0	0	**214**
Total FY03	8	138	710	825	661	509	140	0	91	0	0	0	0	0	0	0	0	**3,082**
Total FY04	9	0	735	684	269	444	105	394	1,222	0	0	162	0	0	0	0	0	**4,024**
Total FY05	14	186	393	406	0	0	0	459	669	0	4	430	0	0	0	0	0	**2,561**
Total FY06	0	0	51	179	0	0	0	19	769	0	38	28	561	801	1564	574	488	**5,072**
Total	**39**	**381**	**1992**	**2094**	**930**	**953**	**245**	**872**	**2,751**	**46**	**42**	**620**	**561**	**801**	**1564**	**574**	**488**	**14,953**

4.8.4 Plan Review and Inspection Resources (Part III.B.8.d)

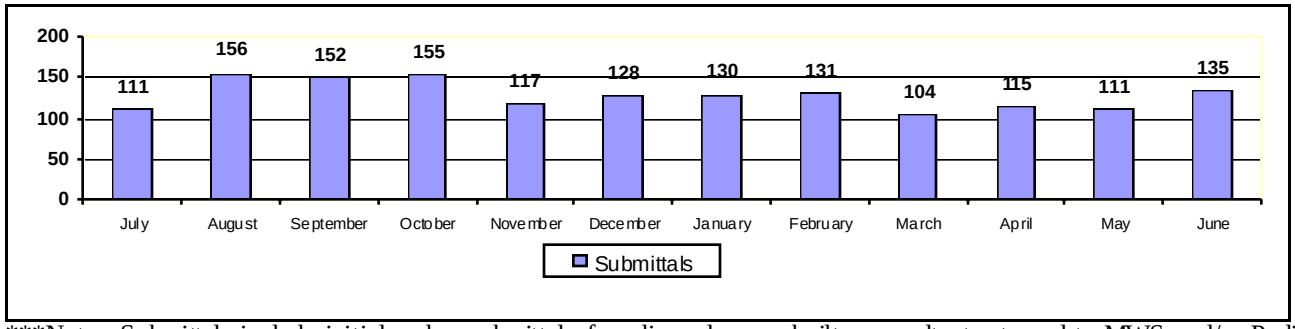
Contact Name: Danny Smith, MWS Engineering Section, 615.862.4799

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
8d	Plan Review and Inspection Resources	Ongoing	•	•	•			

In permit year 3, the NPDES Department was able to increase the number of construction site inspectors by 2 individuals from the previous permit year. This increase in inspectors in combination with the NPDES Department reorganization effort has allowed Metro to conduct more numerous and frequent inspections of construction sites.

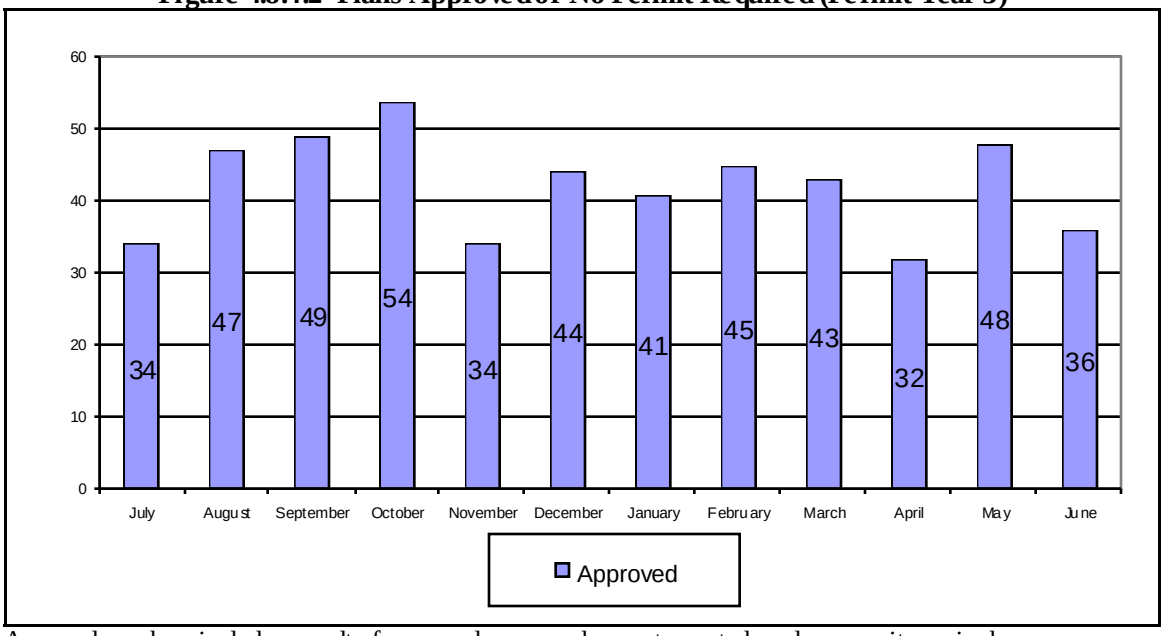
During permit year 3, the stormwater Plan Review Section employed 8 engineers. Given the amount of development across the county, the Plan Review Section continued to experience a backlog of plan submittals. In order to compensate for some of the backlog, the Plan Review Section contracted out a portion of grading permit plan review to an environmental engineering firm. There were approximately 1,427 sets of plans submitted to the Plan Review Section in permit year 3. These submittals include, among other things, initial and re-submittal of grading plans, as-builts, consultant plan reviews and/or Preliminary Planned Urban Development submittals. Overall, there were 507 plans that were approved or designated as "no permit needed" by the Plan Review Section during permit year 3. In permit year 3, there were also 1,040 plans not approved by the Plan Review Section.

Figure 4.8.4.1 Plans Submitted for Review (Permit Year 3)



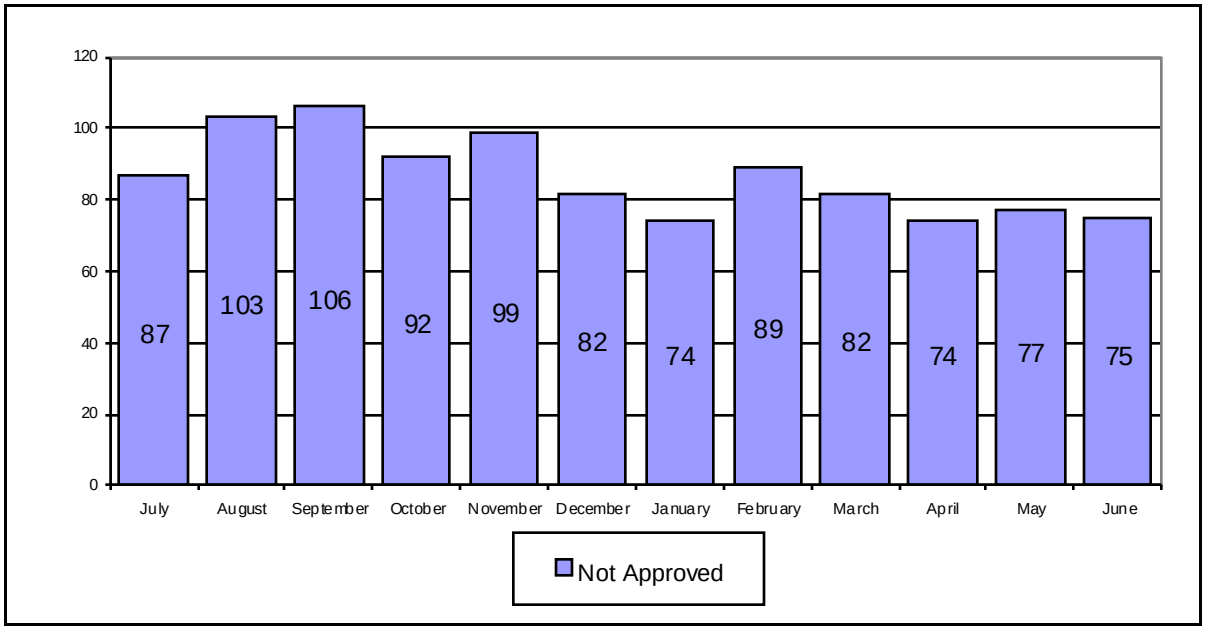
***Note: Submittals include initial and re-submittal of grading plans, as-builts, consultant returned to MWS and/or Preliminary PUDS.

Figure 4.8.4.2 Plans Approved or No Permit Required (Permit Year 3)



***Note: Approval numbers include a result of approved, approved except as noted, and no permit required.

Figure 4.8.4.3 Plans Not Approved by MWS Stormwater (Permit Year 3)



The actual issuance of grading permits is performed by inspectors within the NPDES Department. Once the grading, drainage and erosion control plans are approved by the Plan Review Section, the NPDES Department facilitates a pre-construction meeting with the developer, contractor, and erosion prevention and sediment control (EPSC) specialist. After the pre-construction meeting, a temporary grading permit letter is issued for the installation of (only) EPSC measures as discussed during the pre-construction meeting. Once the EPSC measures are installed correctly and verified by NPDES staff, the grading permit is issued for complete site grading per the approved site plans. During permit year 3, the NPDES office facilitated 296 pre-construction meetings and issued approximately 252 grading permits. The NPDES Department was also responsible during the last permit year for inspection of all the active construction sites within the county. At the end of permit year 3, there were nearly 600 active grading permit sites that required NPDES inspection.

4.8.5 Metro Activities (Part III.B.8.e)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
8e	Evaluate Metro Activities	PY 2		•				

During permit year 2, the NPDES Department began to evaluate construction site runoff originating from Metro activities. It was determined that there are several different departments within Metro that perform land disturbance activities that could contribute to polluted stormwater runoff. Some of the land disturbance activities that are performed by various Metro departments include MWS utility construction and rehabilitation, MWS stormwater maintenance projects, Public Works road and sidewalk construction/repairs, Parks Department construction and land maintenance, and Real Properties construction/renovations. Most of the large projects performed by Metro departments are contracted out to private companies that perform the actual site grading work. Currently, utility projects such as water line and road construction are exempt from obtaining grading permits through the NPDES office per Volume 1 of the Storm Water Management Manual. A concerted effort was initiated during permit year 2 to educate various Metro departments and contractors on proper Erosion Prevention and Sediment Control (EPSC) practices, especially on those projects not requiring grading permits. NPDES staff have been providing input to major water, sewer, and stormwater maintenance projects. Most of the smaller projects that involve repairs and rehabilitations are performed by Metro work crews. The NPDES Department continued to be a resource to other Metro departments regarding grading activities during permit year 3.

4.8.6 Future Direction of Element 8 – Construction Site Runoff

Ordinances, Regulations and Guidance

Once the new regulations go into effect, the existing ordinances and regulations will continue to be enforced until new regulations are implemented. An NPDES staff member will be devoted to continuously reviewing stormwater regulations and ordinance for potential updates.

Training

Plan reviewers and construction site inspectors will continue to be informed of and educated on the latest and most effective management practices. Meetings between these two groups are ongoing and will continue throughout the permit cycle.

Records Management

Inspections and any enforcement actions will continue at a steady rate through the fourth year of the permit. These inspections will be documented in the NPDES database and tallies will be updated monthly.

Plan Review and Inspection Resources

MWS will continue to evaluate whether the staffing levels of the inspection and Plan Review Sections are effective in meeting the permit needs to control construction site runoff.

Metro Activities

The NPDES office will continue to manage construction site runoff from Metro activities. In order to accomplish this task, NPDES will have to take a two-prong approach to manage the runoff from activities requiring a grading permit and those not requiring a grading permit. Metro activities requiring a grading permit allow NPDES to have adequate oversight to prevent pollutant runoff. For the activities not requiring grading permits, NPDES will work to continue the education of different departments on proper EPSC measures and in educating those Metro permittees that engage in land disturbance activities which do not rise to the scope of needing a Metro Grading Permit.

4.9 Habitat Improvement (Part III.B.9)

The objective of Part III.B.9 of the permit is for MWS to investigate and report potential areas of stream habitat improvement within Davidson County.

4.9.1 Report Habitat Improvement Activities/Projects (Part III.B.9.a)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
9a	Report habitat improvement activities/projects	Annually	•	•	•			

Metro recognizes the benefits habitat improvements can bring to the water quality of Davidson County streams. Many of Metro's departmental activities, while designed to benefit society, also provide improvement to aquatic habitat and water quality. One example is the many projects conducted by the Metro Parks Department that are designed to provide recreational opportunities. These activities may ultimately provide long-term habitat improvement and increased water quality. One particular effort has been the establishment by the Metropolitan Council of the Greenways Commission of Metro Parks and its Citizens Advisory Committee (CAC). The Commission and the CAC oversee the community's public/private greenways effort. Several greenways, featuring hiking, biking, horseback riding trails, and walking/running paths have been established along streams in Nashville. MWS presently has a staff member on the greenway committee to promote and enhance habitat and water quality improvements of the program. Overall, greenway projects have improved habitat and water quality across the county by preserving, through a conservation easement, many miles of stream corridor that would, otherwise, be subject to potential development. Currently, Metro has approximately 6.5 miles of various stages of greenways under construction. To date, Metro manages approximately 29.5 miles of total greenway within Davidson County. Presented below are some of the more recent greenways and other Park projects/activities.

- Adoption of the 2002 Parks & Greenways Master Plan that identifies conservation of Davidson County's seven main water corridors as greenways.
- Completion of 23 miles of greenway trails and conservation of over 3800 acres of land, including:
- Shelby Bottoms Greenway and Nature Park on Cumberland River (800 acres);
- Downtown Greenway (connects Riverfront Park to the Bicentennial Mall);
- Metro Center Levee Greenway;
- Mill Creek Greenway – Ezell Park;
- Mill Creek Greenway – Blue Hole Road;
- Harpeth River Greenway;
- Stones River Greenway – Two Rivers Park to Heartland Park;
- Stones River Greenway – YMCA to Percy Priest Dam;
- Richland Creek Greenway – Phase I;
- Brookmeade Park Cumberland River Greenway;
- Beaman Park – Phase I;
- Bells Bend Greenway — Master Plan completed; and
- Bellevue Greenway

Another program performed by the Parks Department that directly benefits water quality and, therefore, stream habitat is the "Bag It" campaign. The "Bag It" campaign is an effort to encourage Metro park users to use the mutt mittens provided at most parks to clean up their pet waste. During permit year 3, the Metro Parks Departments distributed an

estimated 126,000 dog waste bags. The Parks Department estimates that in distributing the pet waste bags approximately 37,000 lbs (18.9 tons) of pet waste were removed from park properties that would have potentially contaminated stormwater runoff.

The Stormwater Maintenance Program is another agency within Metro that strides to incorporate habitat improvement measures. As the majority of the maintenance projects are designed to relieve residential or public right-of-way flooding, some of the larger stormwater Capital Improvement Projects (CIP) allow flexibility to incorporate some aspect of habitat improvement. A good example of this was the Antioch High School (Project #03-SD-0416) Capital Improvement Project (CIP). An intermittent stream originating on the Antioch High School property was draining straight into an adjacent subdivision street, where the water would collect roadway pollutants and eventually flow to the roadside catch basins. The stream was causing a substantial amount of erosion of the curb and gutter at a point where it enters the street, and major flooding to the streets and residences during heavy rains. Figure 4.9.1.1 depicts photographs of the stormwater problems that are persistent in the residential area downstream of Antioch High School.

Figure 4.9.1.1 Antioch High School Project

During permit years 1 and 2, MWS staff and AMEC engineers collaborated on a design to relocate this intermittent stream to drain around the subdivision, bypassing the road all together. The design of the relocated channel incorporated habitat and water quality improvements, such as native riparian plantings, erosion control matting, low-flow channel, and hand-placed river cobble. The design of the relocated channel will add more than 1,600 linear feet of open channel intermittent stream, which will directly improve stream aquatic habitat. During permit year 2, applicable state and federal permits were obtained and a contractor was hired to construct the project. The construction of the project was completed in permit year 3.

Figure 4.9.1.2 Antioch High School Project Design

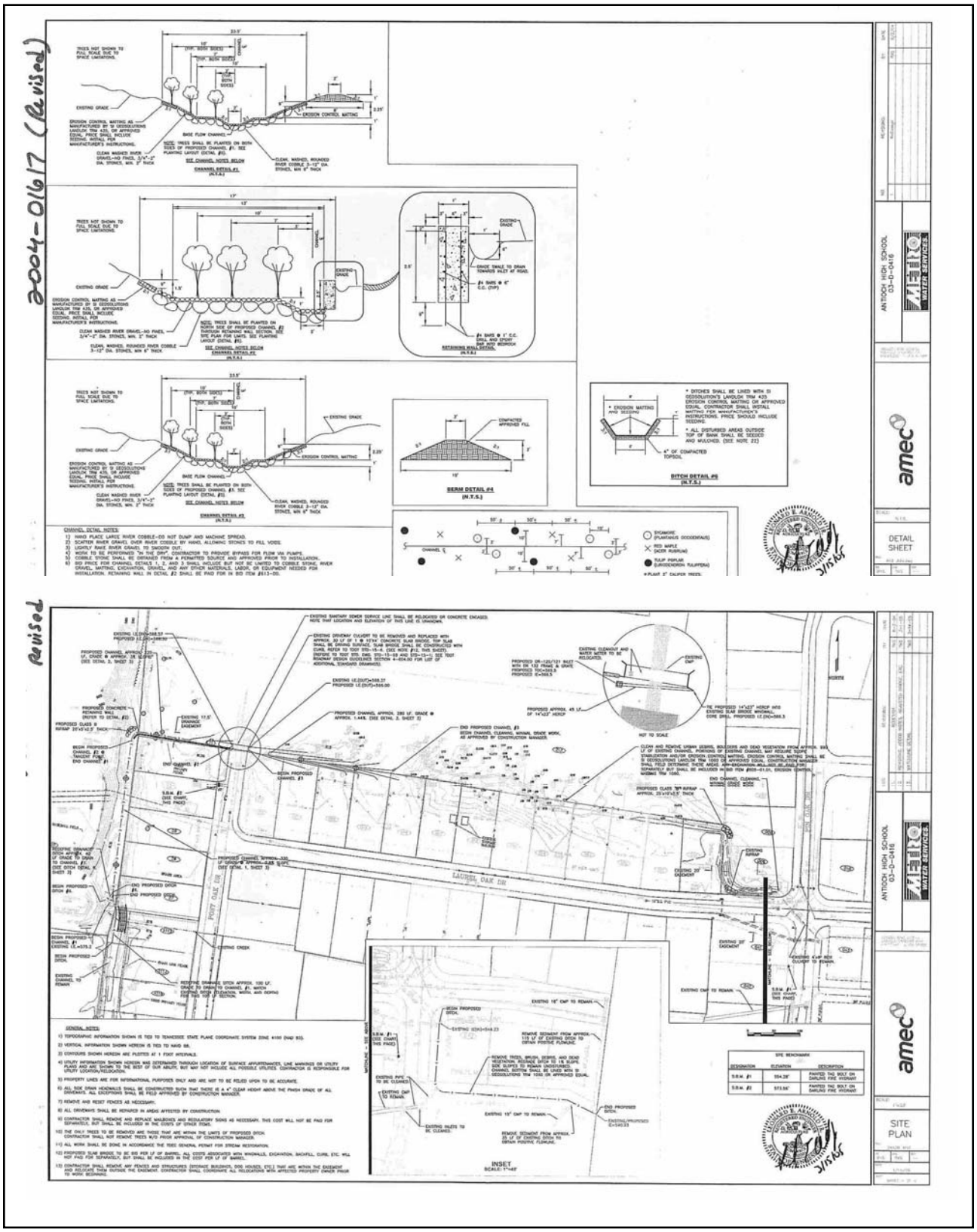


Figure 4.9.1.3 Antioch High School Project Channel One Year Post Construction

Photo taken during the dry summer months

MWS stormwater maintenance program also conducts routine cleanouts of ditches and streams. The maintenance staff removes trash and other debris that impede flow, which benefits aquatic habitat and water quality.

In addition to incorporating habitat improvement projects into Metro departmental activities, the NPDES department has been forming partnerships with other agencies and organizations to perform various habitat improvement projects. In one particular project Metro has partnered with the Tennessee Department of Agriculture and several other State and local agencies on the Sevenmile Creek Watershed Community Project. This project is an initiative to improve or preserve water quality in healthy streams and to restore and de-list polluted streams within the Sevenmile Creek Watershed. This project is funded through 319 Grant monies with the goal to restore riparian areas, improve in-stream habitat, install BMPs specific to pollution sources of the watershed, promote public/community interest, awareness, and cooperation in maintaining and improving water quality; and also engage developers, regulators, and planners in smart development techniques and practices for water quality. The program will install stream buffers on public lands, implement model stream buffers in a private residential community, implement in-stream habitat improvements for the Nashville Crayfish (*Orconectes shoupi*), and develop educational greenway trails along the stream at the Ellington Agricultural Center property. In permit year three, many of the on-the-ground operations started.

During routine field work in permit year 3, NPDES staff discovered a large segment of a tributary to Mill Creek in which habitat had been altered. This stream was located on a large parcel of state-owned property with much of it being channelized and substrate lined with flag stone. Dr. Steve Winesett arranged a meeting with the Tennessee Stream Mitigation Program (TMSP) to see if this site would classify as an in-lieu fee mitigation project. After several meetings, the TMSP decided to perform a stream restoration project on the impaired segment of this stream. Figure 4.9.1.4 depicts the preliminary conceptual design of the restoration project. The NPDES Department will report the progress of this project in future permit years.

Figure 4.91.4 Conceptual Map of the Preliminary Stream Restoration Design for Pavillion Branch

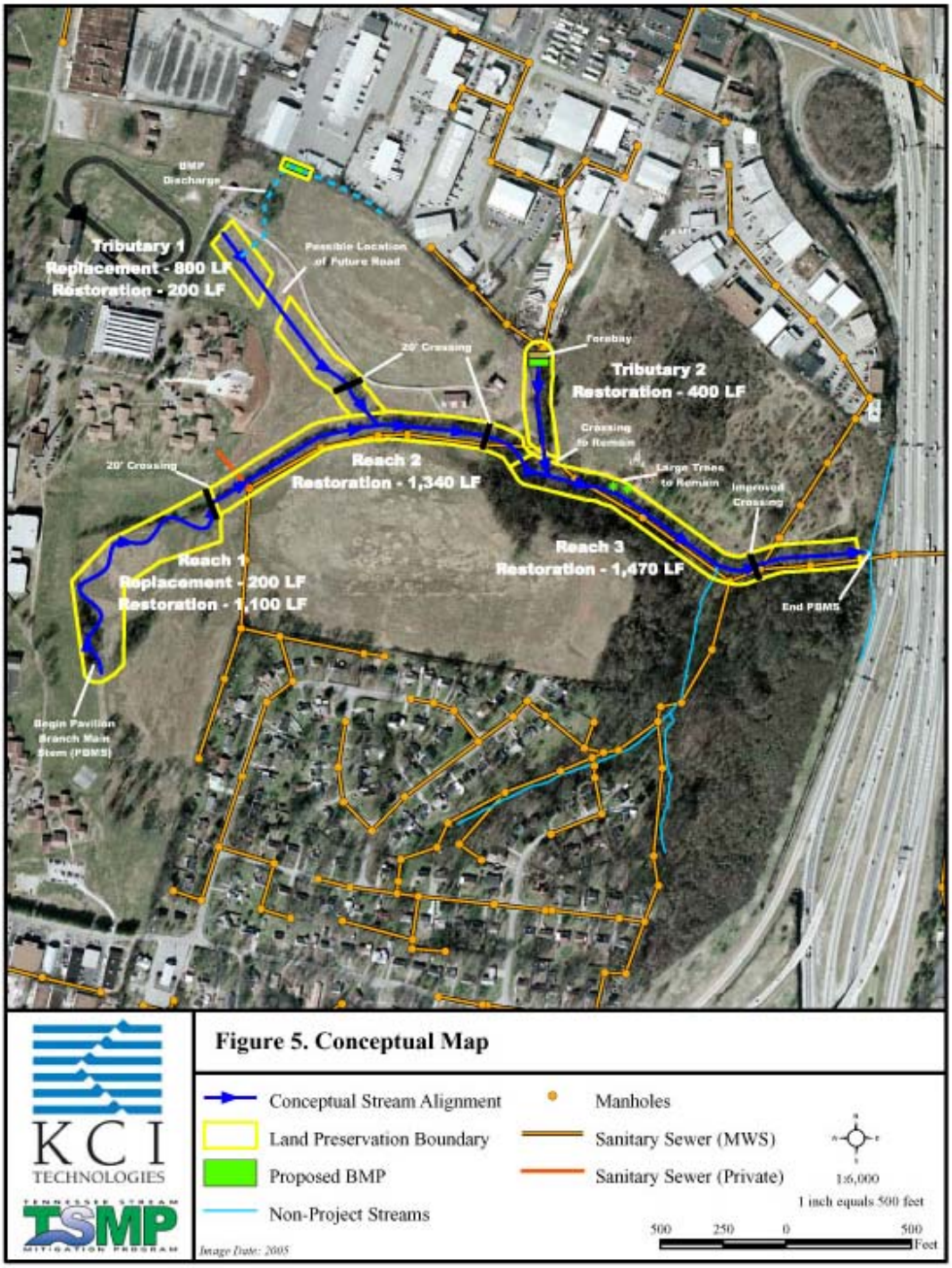


Figure 4.9.1.4 Edmondson Pike Library Tree Planting

During permit year 3, the NPDES Department also recognized an opportunity to incorporate habitat improvement into a public education event. The NPDES Department, with help from Metro Libraries and the MWS Public Information Officer, held a public education event to plant approximately 60 native species of trees and shrubs in the riparian zone of Sevenmile Creek. At the event, MWS staff explained the role that riparian buffers play in filtering water quality and providing shade to the creek on the Edmondson Pike Library property. Figure 4.9.1.4 displays the general planting plan and photographs of the trees that were planted.

Another habitat and water quality program that MWS Stormwater is involved with is the floodplain buyout program. This program utilizes Federal Emergency Management (FEMA) matching funds to purchase residential properties that qualify. Once the floodplain properties are purchased, the houses and other structures are carefully demolished. The NPDES Department is currently looking at possible floodplain enhancement projects to be performed on the buyout properties, such as riparian buffer restoration, infiltration basin installations, etc. Figure 4.9.1.5 depicts the before and after aerial photographs of several buyout properties located on Blackman Road.

Figure 4.9.1.5 Blackman Road Floodplain Buyout Property

4.9.2 Future Direction of Element 9 – Habitat Improvement

This program element's objective is to make TDEC Water Pollution Control aware of habitat improvement activities in the permit area. In satisfying this permit element, Metro takes the opportunity to search for other areas within different departments where habitat improvement could be integrated into normal department tasks. The NPDES Department will continue to report any habitat improvement projects performed in the county during future annual reports.

4.10 Public Information and Education (Part III.B.10)

This element is designed to meet Part III.B.10 of the permit by facilitating an ongoing program of public education and outreach efforts. Areas of education include general housekeeping procedures such as the use, storage, and disposal of pesticides, herbicides, fertilizers, used oils, and other hazardous chemicals; identification and prevention of illicit connections and discharges and long-term water quality impacts; responsible construction that prevents erosion and sediment loss; and detention pond maintenance. These topics are presented to audiences ranging from school children to homeowners' associations to developers and engineers.

The NPDES Program is committed to addressing the public education requirements of the permit. The public education program involves a joint effort between NPDES staff and the MWS Public Information Officer (PIO), Sonia Harvat, as well as other key Metro departments.

4.10.1 Public Education of Other Elements (Part III.B.10.a)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420
Sonia Harvat, MWS Public Information Officer, 615.862.4494

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
10a	Inform Public – General Housekeeping Procedures	Ongoing – at least one activity per year	•	•	•			See Activity 1F
	Inform Home Owner Associations – Detention Pond Maintenance							See Activity 1G
	Educate Engineering and Development Community – Long Term WQ Impacts							See Activity 2A / 2D
	Inform Public – Pesticides, Herbicides, and Fertilizers							See Activity 5B
	Inform Public – Oils and Hazardous Chemicals							See Activity 5B
	Inform Public – Illicit Connections / Discharges							See Activity 6D
	Educate Engineering and Development Community – Construction WQ Impacts							See Activity 8A
	Other Not Yet Identified Opportunities							

Inform Public - General Housekeeping Procedures

The following components of the public education program are geared toward educating the general public on proper housekeeping measures:

- The NPDES Department and the PIO held several public education events throughout the year. Representative photographs of events are presented in Figure 10.1.1. Some of the events are designed to be a hands-on training, while others are designed to present stormwater quality information to the public. During permit year 2, the NPDES Department ordered public education material such as magnets, pens, cups with water quality logos, that will be given out at future events.

Figure 4.10.1.1 Typical Public Education Events

- In previous permit years, the NPDES Department developed a general brochure that summarizes the NPDES Program and explains ways for the general public to prevent stormwater pollution. This brochure, titled "Water – Protect It With Your Lifestyle", is given out at presentations and events where NPDES staff are present and is available for pick up at several Metro offices (See Appendix B).

- The NPDES Program provides a Stormwater Pollution Hotline (313-PURE) for reports related to any discharge or activity that is contributing to water pollution. The hotline functions 24-hours a day, 7-days a week and is managed through the NPDES Program office. This hotline number is included on all of NPDES educational materials. The NPDES Department has also created a website that also provides the public a forum for reporting stormwater quality problems via email. The address to the website is:
  www.nashville.gov/stormwater/.

- Metro runs a video on Channel 3 (public access channel) throughout different times of the year that specifically addresses construction site stormwater runoff and the grading permit process.

- The NPDES Program has a logo and slogan (Pure Nashville…Right as Rain) that is extensively promoted on program materials such as vehicles, website, etc.

- NPDES staff and the MWS PIO give numerous presentations to educate the general public on what stormwater pollution is and how the public can help to reduce pollution. A list of the presentations provided by NPDES staff are attached in Appendix A. Many of these presentations are also available on the Metro Stormwater website.

- NPDES staff uses government-issued vehicles in performing its functions of sampling, complaint investigation, and construction inspection. In an effort to promote its program and public awareness, the NPDES Department displays the NPDES logo and hotline phone number on the nine (9) NPDES Department fleet vehicles (see Figure 4.10.2).

Figure 4.10.2 NPDES Truck and Van

- Water Works! is a pilot public education program through the Middle Tennessee State University (MTSU) Center for Environmental Education designed to promote clean water in Tennessee through a series of public service announcements, both video and audio, promoting water quality through responsible action. Water Works! is partnering with the Phase I and II MS4 municipalities in Tennessee to complete their required public education mandate. MWS has been participating in the education campaign over the past few years. During permit year 3, the Water Works! program aired approximately 5,865 radio spots and 59 television spots. The Water Works! radio and television airings equated to a total market value of approximately $286,170.25

- MWS routinely sends out notices to all properties located in the special flood hazard area, approximately 10,000 properties. The pamphlet, found in Appendix B, is individualized to show a map of the owner's property and floodplain. The pamphlet also includes general information about flood hazard areas, flood insurance, safety, permitting requirements, drainage system maintenance, and illicit discharges.

- During permit year 3, the NPDES Department began a rain barrel distribution program. Through a partnership with a local business, the NPDES Department obtained old barrels from the industry, cleaned out the product residue (which was a substance used in a beverage preparation process), and gave them away for free to the interested general public. Along with giving away the barrels, a set of instructions on how to construct a rain barrel were also given out. During permit year 3, the NPDES gave out 72 barrels with instructions on converting them to rain barrels and 20 barrels that were converted to rain barrels by the NPDES Department. Figure 4.10.1.3 is a photograph of one of the rain barrels given out by the NPDES Department

Figure 4.10.1.3 Example Constructed Rain Barrel Given out by the NPDES Department

Inform Homeowner Associations - Detention Pond Maintenance
During permit year 2, NPDES Department began a pilot BMP inspection program. The program was initiated to identify compliance issues with detention ponds and the best available methods to bring a site into compliance. It was determined from the pilot inspection program that there are many compliance issues associated with existing detention ponds. During permit year 3, NPDES sent out general BMP maintenance brochures to all of the properties in the NPDES BMP database that had valid street addresses. There were approximately 1,083 BMP maintenance brochures mailed out in permit year 3. The NPDES Department will attempt to obtain accurate mailing addresses for the remaining sites in the BMP database to send the general maintenance brochure in permit year 4.

Educate Engineering and Development Community – Long Term Water Quality/Construction Water Quality Impacts
MWS works along with TDEC and the University of Tennessee in presenting the TDEC Erosion Prevention and Sediment Control Training and Certification Workshops in the Nashville area. This class is a foundation-building course open to the public, but intended for all levels of government, plan preparers and reviewers, and designers and engineers. The course aims to build a solid working knowledge of erosion and sedimentation processes and practices and hydrologic cycles. It provides a better understanding of the impact of erosion on Tennessee's natural resources and of Best Management Practices for erosion prevention and sediment control on construction sites. In permit year 3, there were three Level I workshops offered in the Nashville area. At each workshop, Dale Binder gave a presentation on the Metro grading permit process.

In addition to the TDEC Level I Workshop, the NPDES Department gave several other presentations in permit year 3 to the local engineering and development community. All of the presentations given by the NPDES office are listed in Appendix B. In addition to the presentations given by them, the NPDES Department has worked over the last few years to improve communication with the development and construction community. In an effort to inform the private sector

of Metro's latest issues in construction, the NPDES Department periodically sends out notices via email to a list of developers, contractors, and engineers that have previously gone through the NPDES pre-construction meeting process.

Oils and Hazardous Materials – Education for the General Public
Over the past few years, Public Works has focused on school based recycling education making presentations at elementary schools throughout Nashville. In addition, Public Works has provided outreach to the public thorough events such as Earth Day and other festivals using display boards, the Kiosk, and brochures to educate the public on recycling and waste management. For example, one special Household Hazardous Waste (HHW) collection event was held in partnership with TDEC where citizens were allowed to bring mercury thermometers and exchange them for digital thermometers. HHW educational material was handed out to the public at this event as well. All mercury thermometers were brought to Public Works' permanent HHW facility for disposal.

The list developed by TDEC of used motor oil recycling centers within Davidson County, along with addresses, phone numbers, and information about proper disposal of used oil, is provided through a link from the NPDES stormwater quality website at http://www.state.tn.us/environment/dca/oil/site11.php.

As mentioned in Section 4.5, the NPDES office initiated a campaign in permit year 2 to educate commercial distributors of herbicides, pesticides, and fertilizers, as well as landscaping companies that routinely apply these chemicals. In permit year 3, the NPDES Department began to work on a brochure that will be handed out to each Food Service Establishment (FSE) that will, among other things, explain stormwater impacts of different chemicals used by businesses such as cleaning detergents. In permit year 4, this brochure is expected to be completed and provided to the FSEs.

Illicit Connections/Discharges – Education for the General Public
MWS NPDES Department continued the ongoing process of educating the public on reporting spills, illegal dumping, illicit connections, and other water quality problems through several types of media, including the use of the telephone hotline, distributing educational brochures, public service announcements, educational events, etc.

The newest and most prevalent form of public education and notification was developed in permit year 1. In 2003, MWS personnel conceived a cartoon character, "Toxic Dude", who is consumer-friendly and approachable. A graphic designer was engaged to bring the staff's concept to life. The cartoon includes a sign that mirrors the design of the catch basin markers used on storm drains. "Toxic Dude" is reminded by fish "What You Dump in a Storm Drain Ends Up in My Home!" and encourages readers "Don't Dump On Us!" (See Figure 4.10.1.2). The stormwater website and hotline numbers are included in the graphic for additional information. As mentioned earlier in the document, the "Toxic Dude" campaign has been nationally recognized by receiving the National Association of Clean Water Agencies Environmental Achievement Award in 2006.

Figure 4.10.1.2 Toxic Dude

One method the NPDES Department uses to judge the success of the public education campaign is to track the number of water quality complaints that are received. As mentioned in Section 4.6, all water quality-related complaints received by or routed to the NPDES Department are logged into databases that track the status of all stormwater quality complaints that are investigated by the NPDES Department personnel. In a careful analysis of the databases over the last couple of years, it is apparent that the amount of stormwater quality complaints that the NPDES Department receives from the general public is increasing. We believe that part of the reason for this increase is the comprehensive public education program that has increased general stormwater awareness. The NPDES Department also reviews the illicit discharge investigation database to determine if there are any trends present within the county. If in analyzing the data regional trends are noted, public education efforts such as the "Toxic Dude" campaign will be more heavily focused in those regions.

In permit year 3, the MWS PIO began two new initiatives, "Inlet Stenciling" program and the "Adopt a Watershed" program, to further increase awareness in the general public on the impacts illicit discharges can have on water quality of streams. Both of the programs are going to be watershed based. The "Adopt a Watershed" program will assign volunteer groups to specific watersheds where they will perform a variety of water quality improvement activities such as inlet stenciling, stream clean-ups, etc. During permit year 3, the MWS PIO purchased stencils that specifically identify the following major watersheds: Browns Creek, Whites Creek, Mill Creek, Stones River, Harpeth River, Manskers Creek, and Richland Creek. An example stencil is depicted in Figure 4.10.1.3.

Figure 4.10.1..3 Typical Stencil Sign based on Watersheds

4.10.2 World Wide Web Site (Part III.B.10.b)
Contact Name: Anna Kuoppamaki, MWS NPDES Department, 615.862.4792

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
10b	World Wide Web Site	---						
	Enhance Public Works Website	Ongoing	●	●	●			
	Provide Reporting Mechanism	Ongoing	●	●	●			
	Establish an Area Dedicated to Recognition	PY 4						

Metro's Cycle 2 NPDES permit contains references to Metro Public Works as the Department that oversees the NPDES permit implementation. However, in April 2002, the Stormwater Program moved from Metro Public Works to Metro Water Services. The NPDES Department and permit management is now located within Metro Water Services. Therefore, the NPDES Department website can be found on the World Wide Web at www.nashville.gov/stormwater (see Figure 4.10.2.1). This site contains an enormous amount of information including summaries about the NPDES MS4 program activities, documents pertaining to NPDES requirements, informative articles to educate the public about water quality impacts and preventative measures, and links to many websites that provide further information about water quality friendly activities and programs in Nashville.

In previous permit years the NPDES Department was given the authority to design and make changes to the Metro stormwater web page. Since this time, the NPDES Department has been routinely updating the web site to make sure only the most up to date information is available.

In permit year 3, the Metro Nashville stormwater web page was visited 39,571 times. This was nearly 6,000 more visits than the previous permit year. A complete web trends report is available in appendix B.

Figure 4.10.2.1 Metro Stormwater Webpage

4.10.3 Future Direction of Element 10 – Public Information and Education

Public Education of Other Elements

Over the next couple of permit years, the NPDES Department, through cooperation with the PIO, looks to significantly boost the public education program. Metro believes that public education will play, perhaps, the largest role in improving the water quality of the Davidson County streams on a long-term basis. The NPDES Department will continue to formulate and distribute educational materials that will promote a better awareness of stormwater pollution prevention within Davidson County. The NPDES Department is also committed to pursuing various other educational mechanisms/opportunities within the community. One particular area that the NPDES Department and PIO will look to step-up is the education of Metro school students. NPDES is hopeful that the Davidson County Board of Education will adopt the program to be included as a part of the Davidson County Public Schools science curriculum. It is the intent of the NPDES Department to facilitate similar programs at any of the various private schools in Davidson County that would like to cover such topics.

World Wide Web Site

As new presentations and revisions to the stormwater program are developed, information will be included on the webpage. It is the desire of MWS to keep the development community and the general public up to date with program changes and/or additions.

4.11 Reporting

This section is designed to meet Part III.B.11 of the permit by summarizing program elements and revisions each permit year and by quantitative and qualitative controls assessment when appropriate. Components of this ongoing element include ongoing data collection, data compilation, and creating the annual report.

4.11.1 Compliance Report (Part III.B.11.a)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
11a	Compliance Report	End of each PY (+ 6 months)	•	•	•			Annually

During permit year 3, Metro recorded and assessed program activities for the year and compiled the annual compliance report. For year three of the second permit cycle, the annual activities have been reported in a concise form.

4.11.2 Propose Third Permit Term Cycle Activities (Part III.B.11.b)

Contact Name: Michael Hunt, MWS NPDES Department, 615.880.2420

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
11b	Propose Third Permit Cycle Activities	End of PY 4 (+ 6 months)						

Metro proposes that it prepare a brief narrative rationale to support its intent for the third permit cycle activities (July 1, 2008 through June 20, 2013) six months after year four of the second permit term (December 31, 2012).

4.11.3 Future Direction of Program Element 11 – Reporting

Metro will continue to track pertinent components of its stormwater management program to aid in the development of the annual report. Databases will be maintained and updated as an ongoing effort. Also, Metro will investigate the development of management tools to facilitate more efficient data collection and report generation for future annual reports.

5.0 Monitoring Programs

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
A	Ambient – 8 or more in-stream locations Sample each site at least 6 times annually	6X Annually (Bi-monthly)	●	●	●			Ongoing
B	Wet Weather – 3 or more in-stream locations Sample each site at least 2 times annually	2X Annually	●	●	X			Samples were unable to be taken due to weather patterns, etc.
C	Industrial – Sampling based on inspections	As needed	●	●	●			
D	Bioassessment – Perform RPB III at 2 designated sites Perform RPB III at 1 or more reference sites	Annually	●	●	●			
D	Bioassessment – Refine Procedures	PY 1	●					Ongoing
D	Bioassessment – Perform "quick assessments" as necessary	Annually	●	●	●			
E	Loadings Estimate – Report EMC changes	PY 5						Ongoing
E	Loadings Estimate – Report annual volume and loading changes	Complete by end of PY 3						

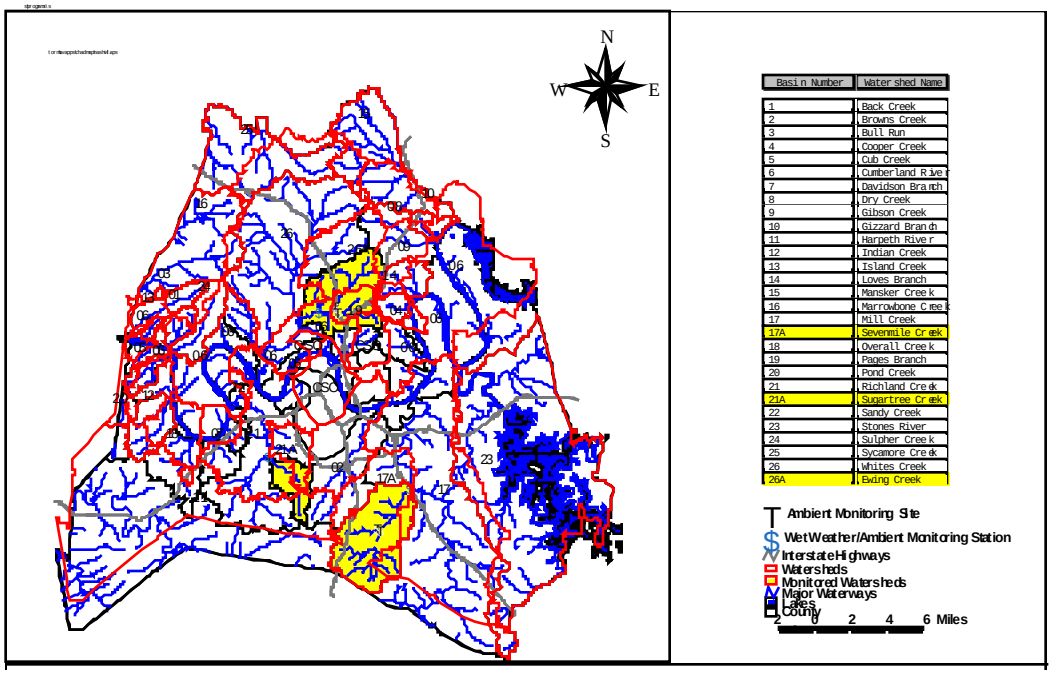
5.1 Wet Weather Sampling

The NPDES Department developed the wet weather sampling program in the first permit cycle. The sampling program was designed as a wet weather characterization approach that focused on stream monitoring to quantify the status and trends in water quality. The data collected was intended to assist the section in ranking stormwater management program resources and practices, and to establish goals for the waterways. The program was based on the assessment of three watersheds with mixed land uses. The watersheds selected, their land use mixes, their expected future development, and potential monitoring locations are as follows and presented in Figure 5.1.1

- Ewing Creek is a tributary to Whites Creek that has been moderately developed for residential and commercial use with a high potential for future development. The monitoring site is located at the Knight Drive bridge crossing.
- Sugartree Creek is a tributary of Richland Creek, located southwest of Nashville's central business district. It is considered fully developed with residential and commercial land use resulting in a low potential for future development. However, there is potential for higher density redevelopment and infill development. The monitoring site is located at the Estes Lane bridge crossing.
- Sevenmile Creek is a tributary of Mill Creek, located in the southeastern corner of Davidson County. It contains partially rural, residential, and commercial use areas and has a high potential for future development. The monitoring site is located at the bridge crossing of Antioch Pike.

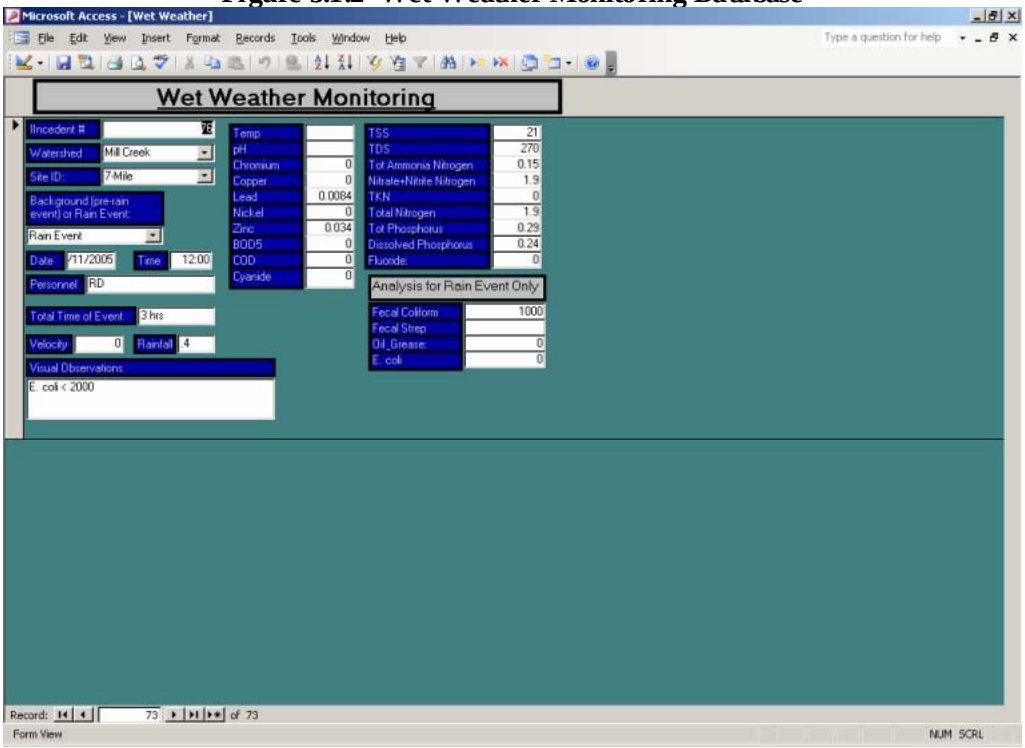
Trained NPDES staff members perform all sample collection and handling. Analysis are conducted using EPA approved methods.

Figure 5.1.1 Wet and Ambient Weather Monitoring Locations



The wet weather monitoring data and other observations are stored in a database illustrated in Figure 5.2.1. Appendix C presents detailed records of the wet-weather sampling activities.

Figure 5.1.2 Wet-Weather Monitoring Database



Metro has been directed by the permit to obtain samples from an optimum event, and has been striving to sample events where qualifying amounts occur at all three sites for more useful comparative data analysis. This permit requirement has proven difficult to achieve and has produced very few useful sampling results. During permit year 3, the NPDES Department was only able to sample one wet weather event on the Ewing Creek Watershed. Due to the weather patterns, the remaining sampling events were not able to be obtained.

During permit year 3, the NPDES Department began coordinating with TDEC to modify the wet weather sampling program to be more aligned with Metro's newly developed Watershed Water Quality Program. The water quality program will combine intensive sampling with pollutant source tracking, development of partnerships with other stakeholders, and public education to remove streams from the 303(d) list. Early in permit year 4, the NPDES Department received approval to perform the modification. Instead of monitoring the same three streams, twice per year during qualifying rain events, the NPDES Department will continue to obtain wet weather samples at the Sugartree Creek site, but will replace the Ewing and Sevenmile Creek sites with drainages that flow to "TMDL" streams. One of the new sample sites will be in the Harpeth River Watershed located off General George Patton Road, while the other new sample site is within the Stoners Creek Watershed located off Lebanon Pike. An additional modification to the wet weather sampling program will be that not all three sample sites will have to be sampled simultaneously during the same rain event. This will allow the NPDES Department more flexibility to route staff during storm events and would greatly improve chances that all samples will be collected during the permit year. Figure 5.1.3 and 5.1.4 depict the locations of the new wet weather sample sites and Figures 5.1.5 and 5.1.6 are photographs of the outfalls that will be sampled.

Figure 5.1.3 Harpeth River Watershed Wet Weather Sample Site Location

Figure 5.1.4 Stoners Creek Wet Weather Sample Site Location

Figure 5.1.5 Harpeth River Wet Weather Sample Site Photo

Figure 5.1.6 Stoners Creek Wet Weather Sample Site Photo

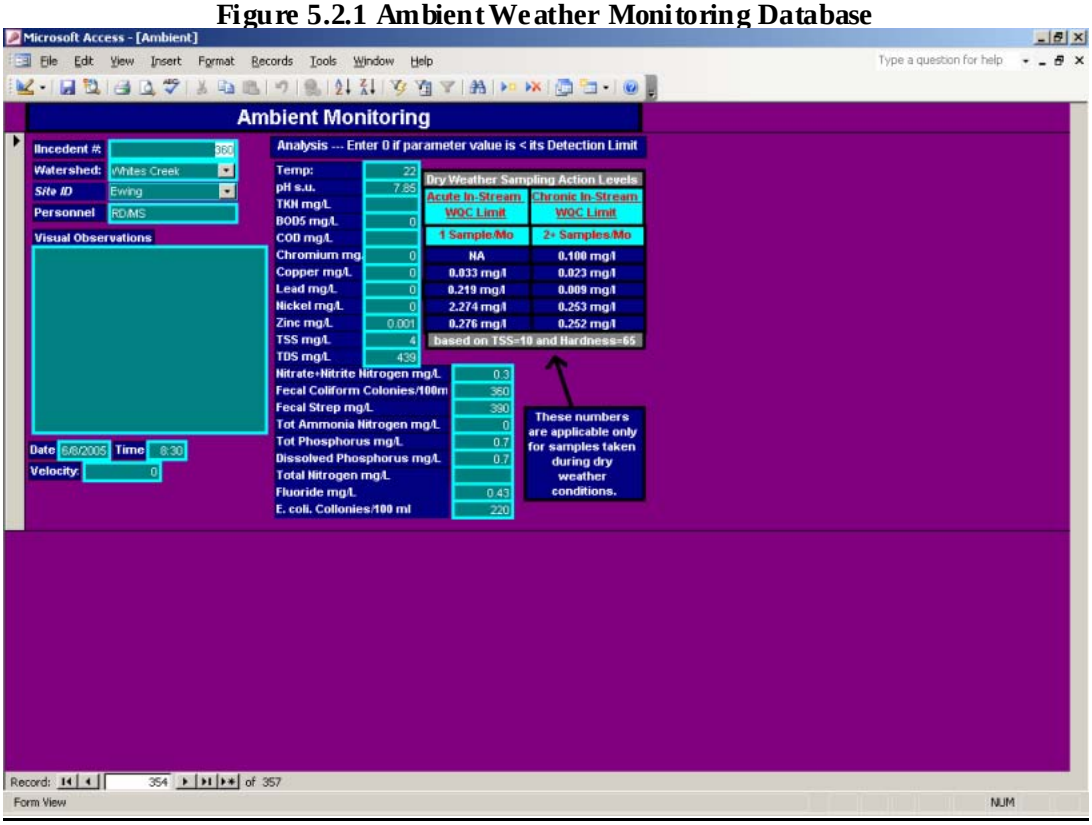
5.2 Ambient Monitoring Program

Ambient stream monitoring occurs in three Metro watersheds (see figure 5.1.1) and includes both grab samples and the measurement of field parameters. In two of the ambient watersheds, samples are collected in the two main upstream tributaries and at a downstream location near the mouth of the stream. The sampling sites in the other ambient watershed are near the mouth of the stream and at a point approximately two-thirds up the stream's length. The ambient sample site locations are described for each watershed below:

- Ewing Creek: North and South tributaries approximately 20 ft. upstream of their confluence accessed through Ewing Lane and the main Ewing Creek branch at the Knight Drive bridge.
- Sugartree Creek: Upstream near the Hobbs Road crossing and downstream under the Kroger on Harding Place.
- Sevenmile Creek: East and West tributaries approximately 20 ft. upstream of their confluence accessed through the Players Club apartment complex and the main Sevenmile Creek branch at the Antioch Pike bridge.

Ambient monitoring is conducted on the first three Wednesdays of even numbered months. Samples are analyzed for the parameters listed in the permit and field measurements of pH, dissolved oxygen, temperature, and conductivity are taken. Ambient monitoring results are entered and stored in the database displayed in Figure 5.2.1. The ambient sampling data is presented in Appendix C.

Figure 5.2.1 Ambient Weather Monitoring Database



5.3 Industrial Sampling

During permit year 3, the NPDES office sampled processed water discharges from two industrial sites declared to be substantial loaders. Figure 5.3.1 depicts the sample locations and Table 5.3.1 presents the results of the sampling events performed on industrial sites during permit year 3.

Figure 5.3.1 Permit Year 3 Industrial Sampling Locations

Table 5.3.1 Samples taken at Industrial Sites in Permit Year 3

	IMI 1 Ambient	IMI 2 Ambient	Quarry 1 Ambient	Quarry 1	Quarry 2
Sample Date	4/27/2006	4/27/2006	4/27/2006	5/24/2006	5/24/2006
Sample Time	10:00am	10:30am	10:20am	12:45pm	1:00pm
Sample Type	Grab	Grab	Grab	Grab	Grab
BOD (mg/l)	10	92	BDL	BDL	BDL
COD (mg/l)	81	100	BDL	BDL	26
Nitrate-Nitrite (mg/l)	1.3	1.4	1.2	1.2	0.77
Oil & Grease (mg/l)	BDL	3.4	3.1	3.5	3.8
Phosphorus, Total (mg/l)	BDL	0.16	0.19	BDL	0.23
Kjeldahl Nitrogen, TKN (mg/l)	8.1	9	BDL	BDL	0.78
Dissolved Solids (mg/l)	630	1100	290	360	290
Suspended Solids (mg/l)	45	300	70	41	66
Iron (mg/l)	0.11	3.2	1.2	0.46	1.1
DO mg/l	N/A	8.4	9.36	7.56	0.03
DO %	N/A	86.7	96.4	88.2	0.5
Specific Conductance (µS)	N/A	305	411.4	593	590
pH	N/A	11.62	7.51	7.13	7.44
temp ℃	N/A	16.5	16.7	23	23.8
Notes:	IMI processed water trickle	IMI processed water illicit	groundwater discharge from quarry	groundwater from quarry	quarry pond

BDL = Below Detection Limit

5.4 Biological Assessment

Metro conducted its program of periodic biological assessment of two urban streams and one reference stream during permit year 3. Early in April of 1999, the NPDES Department submitted its chosen bioassessment sampling sites and protocols to TDEC. The Director of Water Pollution Control subsequently approved the submittal. The NPDES Department originally chose Sevenmile Creek and Sugartree Creek as the two stream bioassessment locations. These sites were chosen because they allowed the NPDES Department to combine new biological data with sampling data that has been and will be gathered. This enabled the NPDES Department to gain a better understanding of the streams' conditions and how activities and situations affect watersheds. Although Sevenmile Creek wasn't actually listed as a currently impacted stream, it was anticipated that it would be designated by TDEC in the 2004 303(d) list. In addition, the "endangered" Nashville crayfish (*Orconectes shoupi*) are present in Sevenmile Creek, and it was decided that this stream should be monitored carefully and improved to ensure the well being of the species. Subsequently, in cycle 1, permit year 5, the NPDES Department determined that Sugartree did not have the base flow necessary to collect adequate biological data. The NPDES Department consulted with TDEC staff and chose Browns Creek as the second stream for biological assessments. It is anticipated that Browns Creek will maintain the base flow necessary to support biological monitoring and was sampled in permit year 1 and 2.

Metro's Standard Operating Procedure (SOP) of the Rapid Bioassessment Protocol (RBP) III, developed in September of 1999, was refined during the first permit cycle. Figures 5.4.1 through 5.4.3 depict samples of stream survey forms that are used in the field.

For the past 3 years, the NPDES Department has more consistently applied the scoring system for the habitat assessments. Instead of having multiple people performing assessments on the same stream, one person handles the assessment. Since the habitat assessment scoring is mostly subjective, keeping staff consistency in conducting the assessment removes some of the variability. Since one staff member has conducted the scoring, that staff member can conduct a quick check for noticeable changes in the field, instead of re-assessing the stream at each visit. In the future, if no changes are noted, a new habitat assessment will not be conducted.

During permit year 3, biological assessments were performed in the fall and spring for both test streams (Browns Creek and Sevenmile Creek) and the reference stream (Whites Creek), except for the Fall 2005 assessment for Browns Creek. This assessment could not be performed due to an illicit discharge observed in the field that created hazardous conditions. The basic habitat for each creek has not changed from previous permit years. Browns Creek and Sevenmile Creek still retain approximately 87% and 78%, respectively, of the reference stream habitat.

The biological survey of the streams yielded the following results. In comparison to the reference creek, Browns Creek scored, out of 100 possible points, a 43 in the Spring 2006. The Fall of 2005 biological assessment for Browns Creek could not be performed due to hazardous conditions of the creek. Sevenmile Creek scored a 76 in the Fall of 2005 and 76 in the Spring of 2006. The NPDES Department also performed an analysis on Whites Creek (reference stream) in comparison to previous permit years. Whites Creek scored a 90 in the Fall of 2005 and a 62 in the Spring of 2006.

Figure 5.4.1 Sample Stream Survey

Stream Survey Information Storet #

Stream: Browns Creek
Stream Location:

County Code: (FIPS) _____ Field # _____ Assessors: _____ MS
Major Basin: _____ Date: 05/10/2004
WBID#/HUC: _____ Time: 11:00 AM
WBID Name: _____ Stream mile: _____
Lat/Long Deg: _____ Stream Order: _____
Lat/Long Dec: _____ Reach file: _____
USGS Quad: _____ 3Q20: _____
Drains to: _____ rm _____ rm ____ Elevation (ft): _____
Ecological Subregion: _____
Objectives:

Samples Collected **Meters used:**

Chemicals Y or **N** Life Assessed? **Macroinvertebrates** Fish Algae Other:
Additional List Attached? Yes / **No** Samples Returned? Yes or **No** Sampling Method: _____

Field Analysis:

pH	8.2	SU	Dissolved Oxygen	99.90	%
Conductivity		UMHOS	Time	11:45 AM	
Temperature	17.5	C	Others		

Previous 48 hours Precip: UNKNOWN **NONE** LITTLE MODERATE HEAVY FLOODING
Ambient Weather: SUNNY **CLOUDY** BREEZY RAIN SNOW

Watershed Characteristics **App. % of watershed observed:**

Upstream Surrounding Land Use: (estimated %)

Pasture		Urban	15	Residential	15
Crops		Industry	70	Other	
Forest		Mining			

Impacts: rated S(light), M(oderate), H(igh) magnitude. Blank = not observed

Causes		Sources	
Pesticides (0200)	Habitat Alt. (1600)	Point Source: Indust (0100) **S**	Municipal (2000)
Metals (0500)	Thermal Alt. (1400)	Logging (2000)	Mining (5000)
Ammonia (0600)	Pathogens (1700)	Construction, Land Dev. (3200)	Road/Bridge (3100)
Chlorine (0700)	Oil & Grease (1900)	U/S Dam (8800)	Urban Runoff (3100)
Nutrients (0900) **S**	Unknown (0000)	Riparian Loss (7600)	Bank Destabilization (7700)
pH (1000)	Siltation (1100)	Agriculture: Row Crop (1000)	Intensive Feedlot (1600)
Organic Enrichment / Low D.O. (1200)		Livestock grazing-riparian (1410)	Dredging (7200)
Other:		Other:	

Physical Stream Characteristics **Length of stream area assessed (m):**

Surrounding Land Use (facing downstream):

Estimate %	RDB	LDB		RDB	LDB		RDB	LDB
Pasture			Urban	15	15	Residential		
Crops			Industry	70	70	Other		
Forest	15	15	Mining					

% Canopy Cover: ____80_____ Open (0-10) Partly shaded (11-45) Mostly shaded (46-80) Shaded (>80)
Bank Height (m): ____.5_____ High water mark (m): _____
Sediment Deposits: None **Slight** Moderate Excessive Blanket
Type: Sludge Mud **Sand** **Silt** None Other Contaminated Y or N
Turbidity **Clear** Slight Moderate High Opaque
Excessive Algae Present? **None** Slight Moderate Choking
Aquatic Vegetation Rooted Floating Type _____
Additional Comments: (Oil sheen, Odor, Color) Strong Vomit Odor

Physical Stream Characteristics (cont.)

	Riffle	Run	Pool
Depth (m)	3"	8"	18"
Width (m)	3	3	4
Reach Length (m)	40	40	20

Staff Guage/ Bench Ht. _____
Velocity (CFS)
Flow (CFS)
Habitat Assessment Sco
RR# _____

Gradient (sample reach): Flat Low Moderate High Cascade
Size (stream width): Very Small (<1.5m) Small (1.5-3m) Medium (3-10m) Large (10-25m)

Substrate (%) **(Visual estimates)**

	Riffle	Run	Pool		Riffle
Boulder (>10")	45%	25%	10%	Clay (slick)	1%
Cobble (2.5-10")	20%	25%	15%	Silt	5%
Gravel (0.1-2.5")	15%	15%	5%	Detritus (CPOM)	3%
Bedrock	5%	10%	60%	Muck-Mud (FPOM)	1%
Sand	5%	10%	5%	MARL (shell frag.)	%

Biological Assessment

List Log Numbers of Samples _____

Relative Abundance of Taxa

Dominant (>50): _____
Very Abundant (30-40): _____
Abundant (10-29): _____
Common (3-9): _____
Rare (<3): _____

Stream Use Support: **Specifically Classified for:** (circle)

Dom. H2O Supply Ind. H2O Supply Navigation Tier II/ Tier III Trout>> N
Water Withdrawl noted _____
Is stream posted? Fish Tissue Advisory: Do Not Consume Precauti
Bacteriological Advisory

Based on Observations and Data, stream is: (circle)
Fully Supporting (FS) Supporting, but Threatened (TH) Partially Supporting (PS) Nonsupp

Comments: Photos **Y** or N Roll # Photo #
8 Crayfish

Stream Sketch

Figure 5.4.2 Sample Habitat Assessment Field Data Sheet (Front)

HABITAT ASSESSMENT FIELD DATA SHEET -- LOW GRADIENT STREAMS

STREAM NAME Browns	LOCATION	
STATION RIVERMILE	STREAM CLASS	
LAT. LONG.	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE 5/11/04 TIME 11:00 **AM** PM	REASONS FOR SURVEY

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat ; lack of habitat is obvious; substrate unstable or lacking.
SCORE 20	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characteristics	Mixture of substrate materials with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 10	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large deep, very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower bank, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Figure 5.4.3 Sample Habitat Assessment Field Data Sheet (Back)

HABITAT ASSESSMENT FIELD DATA SHEET -- LOW GRADIENT STREAMS

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 19	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank had erosional scars.
Score (LB) 8	Left Bank 10 9	8 7	5 4	2 1 0
Score (RB) 8	Right Bank 10 9	8 7	5 4	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
Score (LB) 7	Left Bank 10 9	8 7	5 4	2 1 0
Score (RB) 7	Right Bank 10 9	8 7	5 4	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
Score (LB) 10	Left Bank 10 9	8 7	5 4	2 1 0
Score (RB) 7	Right Bank 10 9	8 7	5 4	2 1 0

Total Score= 144

Figure 5.4.4 Example Biological Assessment Calculation Sheet

(Note: this presents only a portion of the assessment data sheet)

Reference Stream	Whites 5/11/04
Test Stream	7-Mile
Date	05/11/2004

Special Notes - Do not use "0"s when enter
You must enter DICs
You must enter habitat scor

Phylum / Class / Order / Suborder / Taxa	Tolerance Value (TV)	Functional Feeding Group (FFG)	Reference Stream Abundance (a)	Test Stream Abundance (b)
Platyhelminthes				
Turbellaria				
Planariidae	6.1	2		2
Annelida				
Oligochaeta				
Lumbriculidae	7.03	7	1	4
Naididae	6.10	4		
Mollusca				
Gastropoda				
Ancylidae	7.02	4		
Physidae	8.80	4		
Planorbidae	6.30	4		
Pleuroceridae	3.40	4	17	11
Pelecypoda				
Corbiculidae	6.10	2		
Sphaeriidae	6.60	2		
Arthropoda				
Crustacea				
Amphipoda				
Gammaridae	6.60			
Crangonyx	7.87	3		2
Gammarus	9.10	3		
Hyalellidae				
Hyallela	7.75	3		
Decapoda				
	7.50	6	1	9
Isopoda				
Asellidae				
Asellus	9.11	3		
Lirceus	7.85	3	58	7
Arachnoidea				
Hydracarina	5.53	5		
Insecta				
Ephemeroptera				
Baetidae	6.10	3	49	102
Caenidae				
Caenis	7.41	3		
Ephemeridae				
Hexagenia	4.90	3		
Ephemerellidae				
Eurylophella	4.34	3	1	
Serratella	1.57	3		
Heptageniidae				
Stenacron	3.58	4		

Reference Site =	a
Test Site =	b
Ttl. Organisms - a	202
Ttl. Organisms - b	200
Taxa Richness - a	16
Taxa Richness - b	14

Comparitive Taxa Richness	%	88
North Carolina Biotic Index Comparitive NCBI	%	104
Functional Feeding Group % Similarity - FFGPS	%	79
Indicator Assemblage Index (IAI)		0.67
Dominants in Common		2
Percent EPT Index	%	43
Community Loss Index		0.50

Metric	Scoring Criteria			
	6	4	2	0
1. Taxa Richness	6	---	---	--
2. NCBI	6	---	---	--
3. FFGPS	--	4	---	--
4. IAI	--	4	---	--
5. DIC	--	---	2	--
6. EPT Index	--	---	---	0
7. CLI	6	---	---	--

BIOLOGICAL CONDITION		0.67
Habitat Percent Comparibility	%	78

NCBI = Σ xi ti / n

NCBI =	Ref.	Test
	5.98	5.77

Comparitive Biotic Index = NCBI sample a / NCBI sample b x 100

Calculation a	Calculation b
Column tv*a/n	Column tv*b/n
0.00	0.06
0.00	0.00
0.00	0.00
0.00	0.00
0.03	0.14
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.29	0.19
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.08
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.04	0.34
0.00	0.00
0.00	0.00
0.00	0.00
2.25	0.27
0.00	0.00
0.00	0.00
0.00	0.00
1.48	3.11
0.00	0.00
0.00	0.00
0.00	0.00
0.02	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Sab = Σ min (Pia, P

Number of Individu in each FFG

FFG	# A
0	0
1	1
2	37
3	117
4	32
5	9
6	1
7	1

Relative Abundance Each FFG (%)

FFG	# A / Pia
0	0.000
1	0.005
2	0.183
3	0.579
4	0.158
5	0.045
6	0.005
7	0.005

Min (Pia, Pib)

0	0.000
1	0.000
2	0.075
3	0.555
4	0.135
5	0.010
6	0.005
7	0.005

QSI / Sab =	0.79
FFGPS =	79

Figures 5.4.5 and 5.4.6 depict typical photographs of Whites Creek, the reference stream, which was assessed in fall and spring of the permit year.

Figure 5.4.5 Whites Creek (Reference Stream) Bioassessment

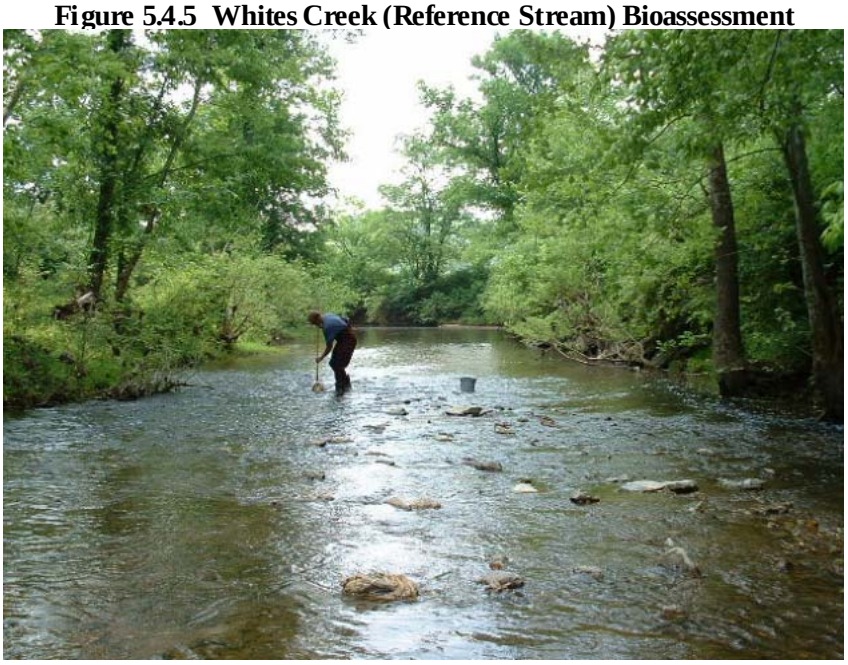


Figure 5.4.6 Whites Creek (Reference Stream) Bioassessment

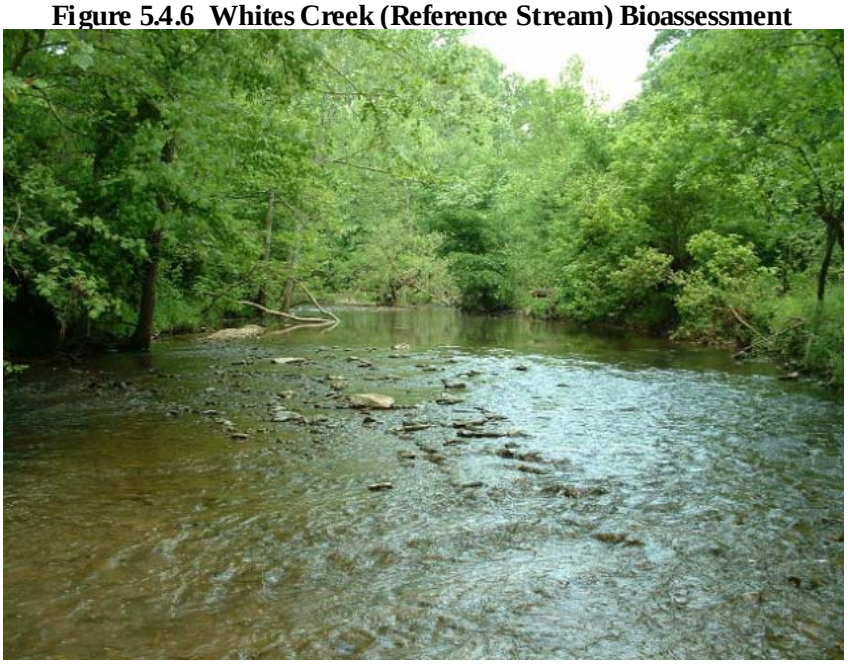


Table 5-1 summarizes the bioassessment findings for both the reference stream and the test streams. This data is derived through biometric calculations, generated through procedures outlined in Tennessee's Biological Standard Operating Procedure Manual.

Table 5.1 Bioassessment Findings

Test Stream	Reference Stream	Biological Score
Whites Creek		
5/4/2000	N/A	---
11/20/2000	"too dry, not done"	---
5/11/2001	Whites 5/4/00	76
10/10/2001	Whites 5/11/01	86
6/4/2002	Whites 5/11/01	76
10/28/2002	Whites 10/10/01	71
5/13/2003	Whites 6/4/02	71
10/22/2003	Whites 10/21/02	76
5/11/2004	Whites 5/13/03	67
10/15/2004	Whites 10/22/03	67
5/11/2005	Whites 5/11/04	81
10/18/2005	Whites 10/15/04	90
5/16/2006	Whites 5/11/05	62
Sevenmile		
5/3/2000	Whites 5/4/00	52
11/20/2000	"too dry, not done"	---
5/7/2001	Whites 5/11/01	90
10/9/2001	Whites 10/10/01	57
5/3/2002	Whites 6/4/02	52
10/21/2002	Whites 10/21/02	52
5/13/2003	Whites 5/13/03	57
10/21/2003	Whites 10/22/03	52
5/11/2004	Whites 5/11/04	67
10/14/2004	Whites 10/15/04	86
5/10/2005	Whites 5/11/05	62
10/17/2005	Whites 10/18/05	76
5/15/2006	Whites 5/16/06	76
Browns		
5/29/2001	Whites 5/11/01	52
10/9/2001	Whites 10/10/01	38
5/30/2002	Whites 6/4/02	48
10/23/2002	Whites 10/21/02	33
5/13/2003	Whites 5/13/03	29
10/23/2003	Whites 10/22/03	38
5/10/2004	Whites 5/11/04	24
10/13/2004	Whites 10/15/04	62
5/11/2005	Whites 5/11/05	33
10/17/2005	Not done-severe illicit discharge made conditions hazardous to health	---
5/15/2006	Whites 5/16/06	43
Sugartree		
Spring 2000	Whites 5/4/00	24
Fall 2000	"too dry, not done"	---

5.5 Loading Estimates

In permit year 5, Metro is responsible for reporting changes from the first permit cycle to the second permit cycle for Event Mean Concentrations (EMC) of a representative storm event, seasonal pollutant loadings and runoff volume. During permit year 3, the NPDES department began to evaluate the method for calculating EMC, runoff volume, and seasonal pollutant loadings. In the first permit cycle, Metro performed the loading estimates utilizing a portion of the MS4 wet weather monitoring data supplemented with Knoxville monitoring data, and National Urban Runoff Program (NURP) data. For purposes of comparison, Metro intends to utilize the same data sources and model developed in the first permit cycle for the second permit cycle analysis. Utilizing Metro MS4 monitoring data, however, may prove difficult in the second permit cycle due to a lack of sample collections under the old wet weather monitoring program and the recent permit modification that changed locations of the monitoring locations. Metro will make every effort to incorporate MS4 monitoring data into the loading estimates for permit year 5.

In permit year 3, Metro began to analyze important characteristics of each of the major watersheds within the county that directly affect pollutant runoff. Table 5.5.1 illustrates the amount of impervious per watershed, while Table 5.5.2 breaks down the land use types per watershed. In the past, imperviousness for the county was estimated based on land use types. Due to the advancement of Metro GIS inventory, the NPDES department was able to obtain an estimate of imperviousness for each watershed by running queries on the pavement, sidewalk, parking lot, and building footprint GIS coverage per watershed. Obviously, there will be some impervious objects that are not included in this analysis, however, the NPDES department believes this estimate to be more accurate than the previous land use-based estimates.

Table 5.5.1 Imperviousness per Watershed

Watershed	Building Footprint (Acres)	Pavement (Acres)	Parking Lot (Acres)	Sidewalk (Acres)	Total Impervious (Acres)	Total Watershed Area (Acres)	Percent Impervious per Watershed
Back Creek	3.36	21.57	0	0	24.93	1620.26	1.54
Bull Run Creek	8.17	49.98	0	0	58.15	2952.05	1.97
Cooper Creek	221.41	190.39	83.8192	7.58	503.20	2373.63	21.20
Cub Creek	3.91	13.54	0.2951	0	17.75	1605.16	1.11
Overall Cumberland River	2223.03	2555.39	2178.9831	184.09	7141.49	51129.34	13.97
Davidson Branch	106.64	116.55	57.6951	0.82	281.71	2391.79	11.78
Dry Creek	265.16	319.02	241.2161	3.13	828.53	5635.37	14.70
Browns Creek	787.55	686.94	1017.7252	22.09	2514.31	8847.37	28.42
Ewing Creek	351.63	751.78	268.7138	8.07	1380.19	9003.38	15.33
Gibson Creek	248.93	226.55	258.7747	11.42	745.67	2749.19	27.12
Gizzard Branch	122.22	133.55	280.1381	2.19	538.10	1466.61	36.69
Harpeth River	508.43	663.48	229.8721	16.04	1417.82	18170.91	7.80
Indian Creek	8.51	28.05	0.826	0	37.39	3929.99	0.95
Island Creek	0.59	10.63	0	0	11.22	516.92	2.17
Little Harpeth	171.1	306.88	63.5401	1.92	543.44	8889.23	6.11
Loves Branch	87.71	181.21	75.3992	1.52	345.84	1457.59	23.73
Manskers Creek	274.24	664.86	270.1081	4.27	1213.48	13075.79	9.28
Marrowbone Creek	58.89	245.26	12.8097	0	316.96	12182.46	2.60
Mill Creek Lower	1639.84	1398.68	1935.2137	31.02	5004.75	20437.24	24.49
Mill Creek Upper	323.95	449.48	328.784	12.1	1114.31	14479.56	7.70
Overall Creek	71.04	146.7	59.0893	1.11	277.94	4950.36	5.61
Pages Branch	131.74	262.95	125.8339	7.12	527.64	2068.73	25.51
Percy Priest Lake Lower	266.91	265.94	314.1108	3.97	850.93	13376.47	6.36
Percy Priest Lake Upper	437.66	495.6	209.3401	8.05	1150.65	19575.01	5.88
Pond Creek	2.65	10.12	0	0	12.77	1688.32	0.76
Richland Creek	1046.48	1020.47	585.9616	38	2690.91	14680.11	18.33
Sevenmile Creek	880.05	790.14	620.3712	24.3	2314.86	10962.35	21.12
South Harpeth River Lower	30.13	145.99	1.4193	0	177.54	9256.78	1.92
Stoners Creek	422.98	479.72	335.3915	13.37	1251.46	7543.58	16.59
Stones River	340.83	436.15	517.885	8.1	1302.97	9258.64	14.07
Sugartree Creek	305	204.18	169.6179	5.62	684.42	3030.72	22.58
Sulphur Creek	17.94	103.15	2.0562	0	123.15	3839.61	3.21
Sycamore Creek	89.73	417.6	34.5312	0.1	541.96	13066.82	4.15
Whites Creek	437.19	1220.5	185.0075	3.6	1846.30	31738.54	5.82
Overall County	**11895.6**	**15013**	**10464.5288**	**419.6**	**37792.73**	**327949.85**	**11.52**

Note: The small Sandy Creek watershed was included in the Overall Cumberland River watershed. Sidewalk data was unavailable for some of the watersheds.

Table 5.5.2 Major Land Use Categories per Watershed

Watershed	Percent Commercial	Percent Industrial	Percent Residential	Percent Open Space/Natural	Percent Transportation	Total Watershed Area (acres)
Back Creek	0.00	0.00	0.00	98.77	1.23	1620.26
Bull Run Creek	0.00	0.00	0.00	97.08	2.92	2952.05
Cooper Creek	0.46	3.09	74.37	6.96	15.12	2373.63
Cub Creek	0.00	0.00	0.00	99.95	0.05	1605.16
Overall Cumberland River	3.53	16.54	30.24	46.85	2.84	51129.34
Davidson Branch	10.48	0.00	86.19	3.31	0.03	2391.79
Dry Creek	7.72	5.52	61.52	22.63	2.61	5635.37
Browns Creek	5.86	23.68	54.93	2.75	12.79	8847.37
Ewing Creek	4.10	5.71	62.34	15.53	12.32	9003.38
Gibson Creek	16.62	2.32	78.32	1.65	1.09	2749.19
Gizzard Branch	51.93	2.26	45.77	0.03	0.00	1466.61
Harpeth River	3.94	0.00	48.88	47.12	0.07	18170.91
Indian Creek	0.00	0.00	0.00	100.00	0.00	3929.99
Island Creek	0.00	0.00	0.00	91.90	8.10	516.92
Little Harpeth	0.48	0.00	59.28	35.75	4.48	8889.23
Loves Branch	8.18	0.00	80.00	1.32	10.50	1457.59
Manskers Creek	6.40	3.29	16.11	71.31	2.90	13075.79
Marrowbone Creek	0.00	0.71	4.50	93.01	1.78	12182.46
Mill Creek Lower	8.92	25.65	51.14	4.05	10.23	20437.24
Mill Creek Upper	5.33	3.03	65.31	20.59	5.74	14479.56
Overall Creek	8.95	0.52	55.94	34.58	0.00	4950.36
Pages Branch	6.25	12.37	59.80	4.80	16.78	2068.73
Percy Priest Lake Lower	1.95	11.56	34.63	47.92	3.94	13376.47
Percy Priest Lake Upper	1.51	0.74	26.86	66.87	4.02	19575.01
Pond Creek	0.00	0.00	0.00	99.96	0.04	1688.32
Richland Creek	3.09	8.74	78.80	7.54	1.83	14680.11
Sevenmile Creek	2.38	4.18	73.61	7.16	12.66	10962.35
South Harpeth River Lower	0.00	0.00	0.00	99.96	0.04	9256.78
Stoners Creek	6.17	4.28	69.50	8.15	11.90	7543.58
Stones River	4.12	39.15	33.65	14.55	8.53	9258.64
Sugartree Creek	6.63	0.00	80.76	1.57	11.04	3030.72
Sulphur Creek	0.00	0.00	0.58	96.21	3.21	3839.61
Sycamore Creek	0.00	0.29	3.06	93.00	3.64	13066.82
Whites Creek	0.69	1.47	20.13	72.77	4.94	31738.54

Note: The small Sandy Creek watershed was included in the Overall Cumberland River watershed. These major categories can be further broken down in future annual reports.

In permit year 3 Metro also performed an analysis of total runoff volume from the MS4. The total runoff volume was calculated using the "Simple Method" as developed by the Stormwater Manager's Resource Center (SMRC). The formula for calculating annual runoff (R=P*Pj*Rv) requires the following information: annual rainfall (P), Fraction of annual rainfall events that produce runoff (Pj), and the runoff coefficient. The NPDES department obtained the Nashville's permit year 3 rainfall amount from the National Weather Service website. Table 5.5.3 illustrates the monthly totals in permit year 3. The fraction of annual rainfall events that produce runoff was obtained from the SMRC website (0.9). The runoff coefficient is based on imperviousness per watershed. Using the watershed imperviousness percentages from Table 5.5.1, the runoff coefficient was obtained for each watershed. The total annual runoff estimates for each watershed is illustrated in Table 5.5.4. Overall in permit year 3, there was an estimated 147,160 acre-foot of runoff from the Metro Nashville MS4.

Table 5.5.3 Monthly Rainfall Totals for Nashville, Davidson County

Month	Rainfall Data (inches)
July-05	2.39
August-05	6.89
September-05	1.44
October-05	0.02
November-05	3.29
December-05	2.46
January-06	6.57
February-06	2.69
March-06	2.9
April-06	4.14
May-06	4.95
June-06	2.19
Total	**39.93**

Table 5.5.4 Annual Runoff Volume Estimates

Watershed	Rainfall Total (P)	Fraction of Rain Events Producing Runoff (Pj)	Runoff Coefficient	Annual Runoff (inches)	Annual Runoff (Feet)	Watershed Area (Acres)	Watershed Area (Square Feet)	Total Runoff (Cubic Feet)
Back Creek	39.93	0.9	0.06	2.15622	0.179685	1620.26	70578525.6	12681902.37
Bull Run Creek	39.93	0.9	0.06	2.15622	0.179685	2952.05	128591298	23105927.38
Cooper Creek	39.93	0.9	0.24	8.62488	0.71874	2373.63	103395322.8	74314354.31
Cub Creek	39.93	0.9	0.06	2.15622	0.179685	1605.16	69920769.6	12563713.49
Overall Cumberland River	39.93	0.9	0.18	6.46866	0.539055	51129.34	2227193833	1200579971
Davidson Branch	39.93	0.9	0.15	5.39055	0.449213	2391.79	104186198.2	46801742.54
Dry Creek	39.93	0.9	0.19	6.82803	0.569003	5635.37	245476887.1	139676962.4
Browns Creek	39.93	0.9	0.3	10.7811	0.898425	8847.37	385391472	346245333.3
Ewing Creek	39.93	0.9	0.19	6.82803	0.569003	9003.38	392187080.3	223155429.2
Gibson Creek	39.93	0.9	0.29	10.42173	0.868478	2749.19	119754742.5	104004299.4
Gizzard Branch	39.93	0.9	0.36	12.93732	1.07811	1466.61	63885636.14	68875743.18
Harpeth River	39.93	0.9	0.11	3.95307	0.329423	18170.91	791524844	260746092.9
Indian Creek	39.93	0.9	0.05	1.79685	0.149738	3929.99	171190355.7	25633615.88
Island Creek	39.93	0.9	0.08	2.87496	0.23958	516.92	22516939.37	5394608.334
Little Harpeth	39.93	0.9	0.1	3.5937	0.299475	8889.23	387214645.4	115961105.9
Loves Branch	39.93	0.9	0.25	8.98425	0.748688	1457.59	63492716.23	47536202.98
Manskers Creek	39.93	0.9	0.13	4.67181	0.389318	13075.79	569581294.8	221747965.7
Marrowbone Creek	39.93	0.9	0.07	2.51559	0.209633	12182.46	530667835.6	111245225.1
Mill Creek Lower	39.93	0.9	0.26	9.34362	0.778635	20437.24	890246096	693176769
Mill Creek Upper	39.93	0.9	0.12	4.31244	0.35937	14479.56	630729463.7	226665247.4
Overall Creek	39.93	0.9	0.1	3.5937	0.299475	4950.36	215637712.1	64578103.83
Pages Branch	39.93	0.9	0.28	10.06236	0.83853	2068.73	90113678.42	75563022.77
Percy Priest Lake Lower	39.93	0.9	0.1	3.5937	0.299475	13376.47	582678845.9	174497747.4
Percy Priest Lake Upper	39.93	0.9	0.09	3.23433	0.269528	19575.01	852687239.6	229822660
Pond Creek	39.93	0.9	0.06	2.15622	0.179685	1688.32	73543036.25	13214580.47
Richland Creek	39.93	0.9	0.21	7.54677	0.628898	14680.11	639465670	402158361.2
Sevenmile Creek	39.93	0.9	0.25	8.98425	0.748688	10962.35	477520088	357513320.9
South Harpeth River Lower	39.93	0.9	0.07	2.51559	0.209633	9256.78	403225119	84529089.76
Stoners Creek	39.93	0.9	0.19	6.82803	0.569003	7543.58	328598331.7	186973272.3
Stones River	39.93	0.9	0.18	6.46866	0.539055	9258.64	403306288.7	217404271.5
Sugartree Creek	39.93	0.9	0.24	8.62488	0.71874	3030.72	132018241.6	94886790.97
Sulphur Creek	39.93	0.9	0.08	2.87496	0.23958	3839.61	167253533.6	40070601.57
Sycamore Creek	39.93	0.9	0.08	2.87496	0.23958	13066.82	569190796.8	136366731.1
Whites Creek	39.93	0.9	0.09	3.23433	0.269528	31738.54	1382530998	372630123.7
							Overall County (Cubic Feet)	6,410,320,889.42
							Overall County (Acre-Foot)	147,160.72

5.6 Future Direction

Metro will continue to meet its monitoring requirements throughout the remainder of permit cycle 2. Throughout the remaining permit cycle, Metro will analyze the benefits received from the monitoring programs.

This Page Intentionally Left Blank

6.0 Assessment of Controls

The effectiveness of the SWMP is assessed for the following reasons:

- To determine whether the most cost-effective best management practices are included in the stormwater management program;
- To assist in design of ongoing monitoring, inspection, and surveillance programs that help refine estimates of program effectiveness;
- To serve as a baseline and ongoing measure of the program's progress; and
- To develop a strategy to evaluate progress toward achieving water quality goals.

Direct measurements of the effectiveness of the SWMP include:

- Expected pollutant load reductions (part 2 application);
- Removal efficiencies of BMPs;
- Reductions in the volume of stormwater discharged; and
- Reductions in event mean pollutant concentrations.

The permit requires the estimation of expected reductions of pollutants from discharges of the MS4 as the result of the municipal stormwater management program. This includes identifying known impacts of stormwater controls on groundwater quality. It is difficult to quantify the performance of controls, since no reasonable conclusions can be made on monitoring and other programs that have recently been initiated. It is recognized that the measures described in this annual report will provide a better definition of the problems and make a positive impact on Metro's contribution to the quality of the "Waters of the State" and groundwater. As more long-term monitoring information and other types of data become available, assessments of the controls operated or otherwise implemented by the NPDES Department will be conducted.

Generally speaking, the post-development BMP requirements for developed sites since 1998 have served to provide a 70 to 80 percent reduction in Total Suspended Solids (TSS) and other selected runoff pollutant parameters. The amount of acreage served by these measures, which serve to reduce stormwater pollutants, will obviously increase as time goes on. In addition, the NPDES Department's increased focus on EPSC measures on construction sites over the past few years has undoubtedly kept hundreds of thousands (if not millions) of tons of sediment on sites as opposed to being washed into the MS4 and local streams. As Metro moves through its second permit cycle, it is anticipated that enhanced stormwater modeling capabilities will allow more technical considerations of pollutant load reductions.

One of the more practicable ways to measure the success of the SWMP is to use quantifiable indirect measurements. Some indirect measurements that can be used to assess the effectiveness of the SWMP include:

- Amount of recyclables performed by Metro (glass, oil, plastic, paper, etc.);
- Amount of waste collected by Metro;
- Number of water quality complaints received;
- Number of construction plans submitted for stormwater review;
- Number of construction plans approved through stormwater;
- Number of stormwater-related enforcements; and
- Number of stormwater-related inspections.

Table 6.1 depicts a comparison between permit years 1, 2, and 3 of Cycle 2 of some evaluated categories. More categories may be added to the comparison in future permit years as the program develops. In addition, future control assessments may include a listing of projects implemented to improve State-listed 303(d) streams. In permit year 2, MWS hired a watershed/water quality manager whose sole job is to develop and oversee implementation of a Watershed Management Plan. The goal of the Watershed Management Plan will be to reduce/eliminate pollutant runoff into community waters with special focus given to State-listed 303(d) streams. Future annual reports will include a section devoted to reporting projects and/or specific activities that have been undertaken to improve the water quality of State-listed 303(d) streams.

Table 6.1 Indirect Measurement Statistics for Permit Year 1 and 2

Categories	Permit Year 1	Permit Year 2	Permit Year 3
Recycled Oil	16 tons	9.1 tons	17.82 tons
Recycled Antifreeze	2 tons	1.7 tons	1.96 tons
Recycled Plastic	266 tons	300.42 tons	**233.28 tons
Recycled Paper	4,477 tons	2,573.84 tons	2954.69 tons
Recycled Glass	1,798 tons	1,052.7 tons	1,107.05 tons
Total Brush Collection	25,613.10 tons	31,702.78 tons	30,498.85 tons
Total Waste Collected	159,595.04 tons	157,622.99 tons	150,972.54 tons
# of Water Quality Complaints Received	161	213	287
# of Construction Plans Submitted to Stormwater	868	1,562	1,427
# of Construction Plans Approved or no Permit Needed	387	449	507
# of Stormwater Enforcements (NOVs and SWOs)	228	197	283
# of Stormwater Inspections	4,024	2,561*	5,072

*This inspection tally does not include the 5 stormwater infrastructure inspectors, who, during Permit Year 2, began inspecting construction sites for stormwater runoff. Recordkeeping for permit year 3 has been modified to include EPSC-related inspections done by infrastructure inspectors.
**The recycled plastic total does not include plastic bottles collected with metal cans.

It is impossible to analyze trends or draw conclusions from three years worth of data. At the end of permit year 5 the data from each permit year will be analyzed to determine if any trends are present that would indicate that the SWMP is or is not functioning as designed.

7.0 Summary of Modifications, Replacements, or Changes

Metro has determined it necessary to modify two MS4 permit elements that will greatly benefit the effectiveness and efficiency of Metro's SWMP. The following paragraphs discuss the changes that will be necessary.

7.1 Permit Element 5b-Use of Pesticides, Herbicides, Fertilizers, Oils, and Other Toxic Materials

Commercial Distributors – Public Information

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY3
			1	2	3	4	5	
PESTICIDES, HERBICIDES, AND FERTILIZERS								
5a	Operate Household Hazardous Waste Facility	At least 1/quarter	•	•	•			
5b	Commercial Distributors – Public Information	Ongoing	X	•	X			This permit element has been modified to focus on "applicators"
5c	Evaluate Metro Facilities Practices	PY 2		•				

Under this permit requirement, Metro is required to distribute educational materials to businesses that sell/distribute chemicals. Metro has concluded this activity to be ineffective. Metro believes that a more effective activity would be to educate the commercial and industrial applicators. In other words, instead of educating the companies and businesses that sell the chemicals, education focus should be shifted toward the businesses and industries that apply chemicals. In permit year 4, the NPDES office will begin to distribute a public education flyer to all of the Food Service Establishments in Metro Davidson County. Part of the focus of this flyer will be on the use of chemicals such as detergents. Figure 7.1.1 depicts the flyer that will be given out.

Figure 7.1.1 Public Education Flyer that will be given out to Each Food Service Establishment

Minimizing Stormwater Pollution Impacts From Your Food Service Establishment:

Additional examples of illicit discharges:

Always maintain a clean lot. Make sure used cooking oils are not spilled around the oil recycling bin and that bins are serviced/emptied regularly. See that dumpster drain plugs are in place and that food dumpster seals are functioning properly and preventing seepage. Always dispose of mop bucket water down an inside drain, mop sink, or sanitary line and never pour mop water outside onto the lot. Clean up all spills using "Dry" clean-up methods (absorbent material), shovel or scoop up, place in sealed container and dispose of in trash.

Never place oil recycling bins near a garbage dumpster. Bins placed too near a garbage dumpster could be knocked over by the garbage truck during collection.

Never pour fats oils or grease (FOG) down storm drains, sewer drains, storm grates, or on the ground!

When outside lots or hood vents must be washed/pressure washed, always use proper contain and capture practices and never allow wash water to enter a storm drain even when using biodegradable detergents. The term "biodegradable" simply means that the product will not harm bacteria in the sewage treatment plant and that it breaks down faster than more conventional products. Biodegradable detergents can cause a fish kill in a creek just as fast as any other type of detergent.

Prevent rainwater "inflow" to the Sanitary Sewer. Repair all sewer cleanout covers, cover outdoor mop sinks, and remove gutters that are discharging to any outdoor mop sinks and drains.

Have Questions?... Call the MWS Storm Water Control Team - Phone: (615) 880-2420 or 313-PURE
WEBSITE: www.nashville.gov/stormwater

Restaurant / Food Service Establishment (FSE)
Guide to "Good Housekeeping"

The following reference material is to be used by the restaurant / FSE as a guide to facilitate compliance under the current Davidson County, **Metro Water Services (MWS) environmental regulations**. However, in order to insure compliance within Metro Nashville/Davidson County, a restaurant / FSE manager must be aware of ***all*** pertinent Metro, State, and Federal regulations and not simply those contained within this document.

When cleaning and sanitizing the floors, kitchens, restrooms, outside dumpster areas and parking lots of a restaurant / FSE, all individuals involved must first understand that the wastewater produced is harmful to the environment and **must be disposed of in a drain which routes to a MWS sanitary waste treatment plant**. **The storm drains and parking lots in Metro Davidson County do not route water to the MWS sanitary waste treatment plant.** Instead, the storm drains and parking lots within Davidson County are part of Metro's Municipal Separate Storm Sewer System (MS4). This MS4 includes all storm drains, roads, ditches, culverts, or parking lots that are designed to route **clean/unpolluted stormwater,** safely into the streams of Metro Nashville/Davidson County.

The NPDES division of MWS has the specific task of monitoring all discharges into this MS4 for the purpose of maintaining the water quality of the streams within Davidson County. If disposed of improperly into the MS4 or stream, **the waste washwater from the restaurant's floor, kitchen, restrooms, outside dumpster area, vent hoods, and parking lot would damage this stream and the aquatic life within it, even when biodegradable cleaners are used**. Nearly all discharges into the MS4 and streams (including the restaurant's waste washwater) are deemed "Illicit Discharges" and are illegal in Davidson County under Metro Code of Laws (Metro Code) § 15.64.205. Additional examples of Illicit Discharges can be found on the back side of this document. If you have questions, contact the MWS NPDES office at (615) 880-2420.

As stated previously, **the dumping of restaurant cleaning wastewater down a drain which routes to a MWS sanitary treatment plant is the proper method of disposal for the restaurant and food prep industry.** Most internal drains including floor drains, sinks, and toilets route wastewater directly to the sanitary treatment plant. By dumping this waste material down a sanitary drain, it is insured that this wastewater will be properly treated at a treatment plant and not have any detrimental effects on the environment. All discharges into sanitary lines/drains that route to a treatment plant are monitored by the Industrial Compliance Section of MWS and are regulated under Metro Code of Laws (Metro Code) §15.50 "Industrial Waste Discharges". If you have questions, call the MWS Industrial Compliance office at (615) 862-4590.

Thank you very much for recognizing the importance of our streams as a valuable natural resource and your help in the protection and improvement of the streams within Metro Nashville/Davidson County.

This publication is a public service of:
Metro Water Services
NPDES Program
Storm Water Quality Control Team
1607 County Hospital Road
Nashville, TN 37218
Phone (615) 880-2420
www.nashville.gov/stormwater

Metro Water Services is in the process of complying with all appropriate Americans with Disabilities Act Guidelines. For additional information contact Joseph A. Estes, Sr., 1600 2nd Avenue North, Nashville, TN 37208-2206; telephone 615-862-4862.

7.2 Monitoring Programs

Wet Weather Sampling

Activity ID	Activities Required By SWMP	SWMP Schedule	Permit year Accomplished					Comments for PY 3
			1	2	3	4	5	
MONITORING								
A	Ambient – 8 or more in-stream locations Sample each site at least 6 times annually	6X Annually (Bi-monthly)	●	●	●			Ongoing
B	Wet Weather – 3 or more in-stream locations Sample each site at least 2 times annually	2X Annually	X	●	X			Unable to obtain samples due to unusual weather patterns, etc.
C	Industrial – Sampling based on inspections	As needed	●	●	●			2 sites sampled
D	Bioassessment – Perform RPB III at 2 designated sites Perform RPB III at 1 or more reference sites	Annually	●	●	●			Ongoing
D	Bioassessment – Refine Procedures	PY 1	●					Ongoing
D	Bioassessment – Perform "quick assessments" as necessary	Annually	●	●	●			
E	Loadings Estimate – Report EMC changes	PY 5						Ongoing
E	Loadings Estimate – Report annual volume and loading changes	Complete by end of PY 3						

As mentioned earlier, Metro will be modifying the wet weather sampling program. The modifications are discussed in detail in Section 5.1.

This Page Intentionally Left Blank

8.0 Fiscal Analysis

Currently, the NPDES program is funded through the annual operating budget of MWS. The annual budgets propose that the expenditures be funded from MWS revenues and from ad valorem property taxes on property in the General Services District (countywide). MWS intends to evaluate other funding options during this permit cycle.

This annual report reflects the budget information for permit year 3. Table 8.1 shows the budgets for fiscal years 2006 and 2007.

Table 8.1 Stormwater Budget

Stormwater Division		Annual Expenditure FY2006	Annual Expenditure "Projected" FY2007
Operating Budget	Administration	$970,200	$939,600
	Engineering and Permits	$868,500	$1,023,200
	NPDES Office	$1,077,600	$1,238,200
	Pumping Stations	$12,500	$12,500
	Remedial Maint.	$2,076,800	$710,100
	Master Planning	$153,200	$2,000
	Routine Maint.	$3,541,200	$3,351,600
Capital Budget	Capital Projects	$7,300,000	$7,696,700
	Total	**$16,000,000**	**14,973,900**
FEMA Buyout	FEMA Buyout	$3,000,000	$3,000,000

This table shows the program elements and their associated stormwater activities. These activities have a direct affect on water quality in Nashville and are further described below:

- Administration – manages programs, provides public with information, offers clerical and support staff;
- Engineering – reviews plans, serves development community, applies regulations;
- NPDES – oversees construction, protects viability of streams, ensures water quality;
- Remedial Maintenance – minor construction to restore existing drainage systems without major improvement or upgrades;
- Master Planning – capital construction projects that replace segments of the drainage system or improve its capacity;
- Routine Maintenance – restores function of the existing system through cleaning and stabilizing without major construction; and
- Capital Projects – improvements or upgrades to existing drainage systems or construction of needed drainage systems.

Several other Metro Programs/Entities (which are not included in the referenced financial information) also benefit water quality in the Nashville area. These programs include the MWS FOG program, various Metro Parks environmental-related programs/initiatives, solid waste disposal, recycling and litter control, Metro Beautification, various Metro Schools environmental programs, etc. It is often extremely difficult and somewhat subjective to attempt to quantify the resources expended by other staff and Metro Programs for water quality-related activities vs. what those same staff and Programs expend on their other non-water quality-related activities. Therefore, it should be noted that while the aforementioned figures apply to the main office responsible for fulfilling Metro's Phase I MS4 NPDES permit obligations (MWS NPDES Office), there are various other Metro expenditures not included in this figure. Future annual reports will better attempt to quantify these expenditures to the maximum extent possible.

Appendix A

Supporting Storm Water Management Program Documents

List of Spill Response Investigations Documented in the City Works in PY3

Tracking #	Date Initiated	Location (Address, Intersection, Or Stanpar)
68007	12/6/2005 9:50	2556 Treetop
68242	12/12/2005 11:05	Bandywood & Hillsboro Cir
68392	12/14/2005 11:36	485 Craighead St
68585	12/16/2005 16:20	I-65 & Jefferson
68605	12/19/2005 11:01	I24 West Bound At Mboro Rd Off Ramp
68760	12/22/2005 15:06	I24 West Bound Near Hermitage Ave Overpass
68761	12/27/2005 8:04	Farnsworth And Post Rd
68930	12/28/2005 12:52	Hallmark Road
68931	12/28/2005 12:58	Dellway Villa
69668	1/11/2006 14:06	Murfreesboro Road Near 702
69669	1/11/2006 14:14	I24 East Bound At I65 Junction
69767	1/13/2006 8:24	4617 Chutney Dr
70360	1/24/2006 6:35	215 Riverside
70655	1/27/2006 7:26	435 Adair Dr
70820	1/30/2006 15:02	39th Ave N
70917	2/1/2006 7:02	178 Townes Dr
71302	2/8/2006 11:25	5901 California Ave
71830	2/21/2006 7:11	516 Basswood
72086	2/24/2006 4:07	12900000400
73122	3/13/2006 6:27	5814 Nolensville Pke
73412	3/15/2006 12:36	821 Hamblen
73439	3/15/2006 15:14	3981 Lawing Dr
74347	3/30/2006 7:17	1412 Central Ct
74676	4/3/2006 15:32	Myatt@ Anderson Rd.
75121	4/11/2006 6:26	3285 Ivey Point Rd
75242	4/12/2006 6:28	2999 Smith Springs Road
75377	4/13/2006 13:59	860 Richards Rd
75384	4/13/2006 14:20	1901 Ed Temple Blvd
75583	4/18/2006 7:09	740 Moormans Arm Rd
75593	4/18/2006 8:57	3847 Crouch Dr
75779	4/20/2006 7:14	8141 Highway 100
76210	4/26/2006 8:07	610 Old Hickory
76378	4/28/2006 9:05	Powell Ave. & Thompson Lane
76676	5/2/2006 5:31	211 Whitsett
76677	5/2/2006 5:43	3417 Lebanon
76764	5/3/2006 6:35	2876 Sugartree Road
78029	5/18/2006 6:51	717 Elysian Fields
78755	5/30/2006 13:24	3015 Ambrose Ave.
78757	5/30/2006 13:31	4990 Lebanon Pike
79539	6/8/2006 6:49	Lincoya Bay Dr
79768	6/12/2006 6:58	1441 Elm Hill Pk
80269	6/16/2006 10:45	I-24 & Clay Lick
80355	6/19/2006 9:58	1026 Argyle Ave
80430	6/19/2006 14:46	Riverside & Porter
80498	6/20/2006 8:59	425 Patina Circle
80983	6/26/2006 12:20	221 Brevard Ct
81219	6/28/2006 10:17	320 Harvard Ave

List of Water Quality Investigations Documented in City Works in PY3

Tracking #	Date Initiated	Location
69411	1/6/2006 13:23	1996 Waterford Dr
69415	1/6/2006 13:29	1999 Waterford Dr
69418	1/6/2006 13:33	2221 Bransford Ave
69421	1/6/2006 13:54	3455 Lebanon
69423	1/6/2006 13:58	1909 8th Ave S
70157	1/20/2006 9:04	Old Hicory & Industrial
70159	1/20/2006 9:12	3121 Milliken
70162	1/20/2006 9:16	2086 Graceland Dr.
70164	1/20/2006 9:23	214 Old Hickory Blvd.
70206	1/20/2006 13:23	936 Gallatin Road S
69323	1/5/2006 10:03	5800 Tru Long Ct
69711	1/12/2006 10:37	1188 Murfreesboro Pike
75792	4/20/2006 10:04	249 Colt Dr
75802	4/20/2006 10:34	1205 Lone Oak Rd
76371	4/28/2006 7:01	6100 Lickton Pike
73566	3/17/2006 6:46	1000 Rivergate Parkway
71616	2/15/2006 6:30	2800 Opryland Dr.
71640	2/15/2006 10:36	5560 Nolensville Rd
71725	2/16/2006 12:57	271 Tusculum
71685	2/16/2006 6:20	401 Harding
71686	2/16/2006 6:39	4815 Franklin Rd
71687	2/16/2006 6:46	1831 River Rd
71691	2/16/2006 7:56	416 Owendale
78478	5/25/2006 6:22	5319 Mt View Rd
78596	5/26/2006 9:25	26 White Bridge Rd
71812	2/17/2006 11:20	6800009900
69803	1/13/2006 11:46	4104 Blueberry Hill Rd
69804	1/13/2006 12:01	539 Opry Mills Dr
76335	4/27/2006 13:34	Stones River&Cumberland River
75997	4/24/2006 9:39	1404 51st Ave N
76008	4/24/2006 10:32	5252 Hickory Hollow Pky
68091	12/7/2005 13:17	200 Polk Ave
68044	12/7/2005 6:31	4817 Citrus Dr
68046	12/7/2005 6:35	4722 Richards Ct
68047	12/7/2005 6:57	1428 Springfield Hghway
74290	3/29/2006 12:41	4660 Nolensville
67998	12/6/2005 6:22	2909 Jones Ave
67707	11/30/2005 10:14	3024 Split Oak Trail
68280	12/13/2005 7:29	524 Murfreesboro Pike
68462	12/15/2005 6:32	1992 Upland Dr
68519	12/16/2005 6:18	501 Nelson Place
68587	12/19/2005 8:03	4736 Nolensville
80705	6/22/2006 8:23	508 Park Ct
74521	4/3/2006 6:41	3451 Lebanon Pike
74522	4/3/2006 7:04	2015 N Gallatin
72305	2/28/2006 10:30	3021 Gallatin
72478	3/2/2006 6:30	6661 River View Dr
72479	3/2/2006 7:12	5910 River Rd
74682	4/4/2006 7:39	4301 Hermitage Rd
72621	3/6/2006 6:50	520 Merritt Ave
72622	3/6/2006 6:58	100 1st Ave S
74985	4/7/2006 7:51	13011 Old Hickory Blvd
77923	5/16/2006 12:54	3701 Edgewater Drive
77926	5/16/2006 13:02	812 18th Ave N
78028	5/18/2006 6:28	150 4th Ave N
67990	12/5/2005 15:16	189 Wallace Rd
69444	1/9/2006 6:53	1010 Camilla Caldwell
69576	1/10/2006 11:00	895 Murfreesboro Rd
69644	1/11/2006 11:20	1008 Wellmoor Ct

Tracking #	Date Initiated	Location
73229	3/14/2006 6:47	726 Mcferrin
73230	3/14/2006 7:03	3036 Fieldstone Dr
73462	3/16/2006 8:57	107 E Trinity Lane
71198	2/7/2006 7:18	521 Opry Mills Dr
70362	1/24/2006 7:53	3434 Hampton Pl
70427	1/24/2006 14:32	189 Spence Lane
68703	12/21/2005 11:39	4774 Lebanon Rd
68705	12/21/2005 11:41	360 Murfreesboro Pk
77136	5/8/2006 7:45	2068 Smith Springs Rd
77137	5/8/2006 7:49	941 Dr Richard B Adams Dr
77301	5/9/2006 8:10	10638 Concord Rd
74054	3/27/2006 11:32	2035 Antioch Pike
74262	3/29/2006 6:37	106 Madison St
79466	6/7/2006 11:06	455 Janette
79477	6/7/2006 12:25	1528 Heritage View Blvd
74346	3/30/2006 6:29	5700 California Ave.
79608	6/8/2006 14:31	1281 Blairfield Dr
67734	11/30/2005 13:13	4125 Old Hickory
67932	12/5/2005 7:26	2068 Smith Springs
67933	12/5/2005 7:58	7016 Bonnavent Dr
78677	5/30/2006 8:30	111 Old Hickory Blvd
78765	5/30/2006 13:50	2828 Elm Hill Pike
78767	5/30/2006 13:58	2828 Elm Hill Pike
72648	3/6/2006 10:32	844 Clematis
72728	3/7/2006 8:32	611 Franklin Limestone Rd
72788	3/7/2006 14:46	1223 Jefferson Davis
72993	3/10/2006 7:53	Gallatin Pike & Myatt Dr
76879	5/4/2006 5:55	2157 Utopia Av
67764	12/1/2005 6:42	1919 Gallatin Pike N
67765	12/1/2005 7:28	150 4th Ave N
67767	12/1/2005 8:01	2103 Eastland Ave
67770	12/1/2005 8:16	2200 Elm Hill Pike
67773	12/1/2005 8:30	201 2nd Av N
67776	12/1/2005 9:07	160 2nd Ave N
67834	12/2/2005 6:54	4701 Grays Point Rd
67835	12/2/2005 7:26	6542 Melinda
67839	12/2/2005 7:59	360 Murfreesboro Pike
67840	12/2/2005 8:17	360 Murfreesboro Pike
67847	12/2/2005 9:10	890 Murfreesboro Pike
67848	12/2/2005 9:14	4801 Nolensville Pike
67850	12/2/2005 9:22	13011 Old Hickory
67854	12/2/2005 9:32	2535 Powell
67862	12/2/2005 9:40	3603 Trimble
67778	12/1/2005 9:31	4040 Armory Oaks Drive
67780	12/1/2005 9:40	1635 Bell Rd.
67783	12/1/2005 10:09	1613 Buchanan St
67786	12/1/2005 10:33	209 Gallatin Pike
77099	5/5/2006 15:46	219 Overby Dr
75176	4/11/2006 11:05	4004 Hillsboro Rd
75243	4/12/2006 6:48	3285 Ivey Point Rd
75381	4/13/2006 14:05	5509 Charlotte Pike
70969	2/2/2006 6:45	523 Elaine Dr
70970	2/2/2006 6:57	221 Gallatin Pike
73675	3/20/2006 12:48	1100 Foster
73684	3/20/2006 14:30	Pin Hook Rd
73898	3/23/2006 7:39	100 Arbor Creek
74063	3/27/2006 13:39	360 Murfreesboro Pike
78297	5/23/2006 7:14	2305 Cabin Hill Rd

List of Construction-Related Investigations of Non-Permitted Sites in PY3

Tracking #	Date Initiated	Location (Address, Intersection, or Stanpar
67491	11/28/2005 9:45	South 11th @ Fatherland St
67838	12/2/2005 7:48	16200010300
67900	12/2/2005 12:55	4704 Whites Creek Pike
68014	12/6/2005 11:08	1446 Bell
68043	12/7/2005 6:19	3597 Abbott Martin Rd
68045	12/7/2005 6:33	1309 Brown St
68048	12/7/2005 6:59	3428 Hampton
68148	12/8/2005 12:09	132 Spence
68150	12/8/2005 13:41	Nolesnsville Rd & Concord Rd
68152	12/8/2005 13:57	Thompson Ln& Dobbs
68203	12/9/2005 11:39	Wooddale Ln & Pennington Bend
68205	12/9/2005 12:02	7149 Riverfront Drive
68247	12/12/2005 11:46	2116 Hobbs Rd
68258	12/12/2005 12:36	344 Nesbitt Ln
68396	12/14/2005 11:53	8188 Poplar Creek Rd
68649	12/19/2005 15:30	244 Hearthstone Manor
68885	12/27/2005 15:39	5003 Crosby Ln
69195	1/3/2006 15:02	18300000900
69412	1/6/2006 13:27	3rd Ave S & Ash St
69417	1/6/2006 13:31	Long Blvd
69572	1/10/2006 10:40	80 Parris Ave
69690	1/12/2006 7:28	Stills Springs Hollow & Hicks Rd
69691	1/12/2006 7:46	8829 Hwy 100
69718	1/12/2006 11:11	4611 Utah Ave
69801	1/13/2006 11:17	Old Hickory & Lebanon Rd
69839	1/17/2006 7:24	4200 Belmont Park Terrace
69892	1/17/2006 11:10	4125 Andrew Jackson Parkway
69902	1/17/2006 12:22	1923 Britt Pl
69952	1/17/2006 15:07	0 Rural Hill Rd
70061	1/19/2006 8:23	2400 Fairfax Ave
70075	1/19/2006 9:02	1309 Katie Ave
70134	1/19/2006 14:57	3543 Seneca Forrest Dr
70163	1/20/2006 9:18	105 Kingston
70306	1/23/2006 11:39	Springdale Drive & Wortham Av
70467	1/25/2006 9:50	4310 Esteswood Dr
70738	1/30/2006 7:51	1303 Belmont Park Ct
70764	1/30/2006 10:03	17200004100
70841	1/31/2006 8:11	4258 Maxwell Rd
71104	2/3/2006 15:19	1919 Ashwood Ave
71168	2/6/2006 14:36	10604 Concord Rd
71372	2/9/2006 11:44	3108 Blevins Road
71413	2/10/2006 7:41	Woodland Forest Subd
71688	2/16/2006 6:50	
72270	2/28/2006 8:29	2708 Wortham
72436	3/1/2006 13:36	8028 Stallion
72712	3/6/2006 14:23	4607 Benton Smith Road
72748	3/7/2006 11:11	3927 Brighton
72749	3/7/2006 11:30	378 Lynn
72798	3/7/2006 16:12	1607 County Hospital Road
72816	3/8/2006 9:47	38th & Charlotte
73324	3/14/2006 13:04	412 Brewer
73449	3/16/2006 7:33	3201 Franklin Limestone

Tracking #	Date Initiated	Location (Address, Intersection, or Stanpar
73516	3/16/2006 13:11	2172 Quail Ridge
73626	3/17/2006 15:35	721 Briksberry
73683	3/20/2006 13:57	1186 Barnes Rd
73721	3/21/2006 6:58	5909 Nolensville
73825	3/22/2006 9:11	Old Hickory & Cloverland
73843	3/22/2006 10:11	Hills Drive Off Marcia Ave
73919	3/23/2006 10:33	1511 Ann St
73954	3/23/2006 15:28	1333 Goodmorning Dr
74038	3/27/2006 8:42	98 Oceola Ave.
74158	3/28/2006 10:10	2505 Dickerson Pike
74291	3/29/2006 13:03	South St & Commerce
74317	3/29/2006 15:07	405 Carters Glen Dr.
74328	3/29/2006 15:22	2911 23rd Ave. S
74351	3/30/2006 8:50	2820 Brunswick
74608	4/3/2006 12:38	469 Kinhawk Dr
74664	4/3/2006 14:54	3178 Parthenon
74665	4/3/2006 14:58	4014 Estes Rd.
74673	4/3/2006 15:21	13204001100
74675	4/3/2006 15:28	142130b00200co
74677	4/3/2006 15:33	5315002400
74680	4/3/2006 16:33	5891 Nolensville Rd
74684	4/4/2006 8:15	17300015000
74685	4/4/2006 8:21	9509000400
74686	4/4/2006 8:39	16108008900
74688	4/4/2006 8:55	2248 Edge O Lake Dr
74811	4/5/2006 8:22	620 May Dr
74845	4/5/2006 12:03	740 Mcmurray
74885	4/6/2006 8:33	3518 Hampton Ave
74938	4/6/2006 12:04	4144 Outer Dr
74988	4/7/2006 9:20	7727 Charlotte Pk
74996	4/7/2006 9:56	322 Wallace Road
75064	4/10/2006 10:09	3991 Crouch
75246	4/12/2006 9:00	3437 Chandler Cove
75257	4/12/2006 9:37	1216 Goodloe Dr
75342	4/13/2006 9:07	1604 Elm Drive
75347	4/13/2006 9:33	Stirrpu Dr & Stirrup Ct
75465	4/14/2006 13:15	3437 Chandler Cove
75466	4/14/2006 13:15	3437 Chandler Cove
75467	4/14/2006 13:15	3437 Chandler Cove
75468	4/14/2006 13:15	3437 Chandler Cove
75469	4/14/2006 13:44	3629 West End Ave
75471	4/14/2006 14:06	3987 Crouch Dr
75486	4/17/2006 7:33	762 Rodney Dr.
75505	4/17/2006 10:16	515 Tanksley Ave
75570	4/17/2006 15:26	8819 Old Charlotte Pike
75808	4/20/2006 10:43	8829 Mccrory Lane
75816	4/20/2006 10:53	8853 Mccrory Lane
75847	4/20/2006 14:45	4264 Maxwell
75853	4/20/2006 14:55	1225 Nichol Ln

Tracking #	Date Initiated	Location (Address, Intersection, or Stanpar
76048	4/24/2006 12:46	1315 5th Ave N
76275	4/26/2006 15:07	6601 Highway 100
76693	5/2/2006 9:34	Brookmont Terrace
77055	5/5/2006 13:11	Wallace Ln & Abbott Martin
77360	5/9/2006 12:28	322 Wallace Rd
77400	5/10/2006 8:43	Huntington Ridge Dr & Ashley Dr
77831	5/15/2006 13:04	950 Graybar
79074	6/2/2006 9:12	Map 63-12 Parcel 7
79142	6/5/2006 7:32	1312 Stones River Road
79254	6/6/2006 7:40	3597 Abbott Martin Rd.
79256	6/6/2006 7:48	4111 Wallace Lane
79257	6/6/2006 7:53	2527 Hobbs Road
79412	6/7/2006 8:48	801 Percy Warner Blvd.
79421	6/7/2006 9:00	River Road
79509	6/7/2006 14:57	1528 Heritage View Blvd
79861	6/12/2006 14:19	600 Clayborne Ct
79895	6/13/2006 7:17	Burton Valley & Benton Smith
80409	6/19/2006 12:40	2956 Riverbend Dr
80424	6/19/2006 14:08	6483 Clarksville Pike
80847	6/23/2006 13:51	700 Stirrup Ct
80849	6/23/2006 14:03	4015 Skyline Dr
81346	6/29/2006 14:09	247 Vaughns Gap

List of Public Works HAZMAT Team Spill Responses in Permit Year 3

Date	Location	Situation	Actions	Agencies
07/14/2005	I-65 N @ harding place	fuel spill	used absorbent 150lbs built burm with gravel	pd, fd, pw,
07/14/2005	whitter @everest	oil spill	used spreader truck to cover oil spill	pw
08/01/2005	allied dr @ vulcan dr	oil spill	absorbent with spreader truck	fd, pd, pw
08/01/2005	33rd ave n @ charlotte	mva, gas & oil spill	put spill gone down & took up absorbent socs & put in 5 gallon buckets	pw, pd, fd
08/02/2005	West trinity @ I-65 off ramp	oil spill	put absorbent down	pw
08/03/2005	elm hill pk @ spence ln	spill	put absorbent down	pw
08/11/2005	1321 Murfreesboro Rd	diesel spill	used 150 lbs spill gone to cover spill	FD, PD, PW
08/20/2005	S.16th @ shelby	oil spill	used 175 lbs ofspill gone	pw
09/09/2005	shelby st @ south 5th st	oil spill	used 200lbs of spill gone	pd, pw
09/12/2005	brick church pk @ trinity ln	oil & diesel spill	used 125lbs of spill gone	pd, pw, tow pro
09/14/2005	trinity @ 1-65	oil spill	used 1450lbs of spill gone to cover spill	pw
09/14/2005	donelson pk @ 1-40 entrance ramp	antifreeze spill	used 5lbs of spill gone	pd, pw, tommys towing service
09/25/2005	benita dr @ paragon mills rd	oil spill	put down 10 lbs of spill gone	pw
10/07/2005	O.H.B. @ LEBANON RD	OIL SPILL	NONE	P.W.
10/09/2005	GEORGE L. DAVIS @ CHURCH ST.	OIL SPILL	USED 50 LBS OF SPILL GONE TO COVER SPILL	P.W. P.D.
10/11/2005	ELLINGTION @ DOUGLAS	OIL SPILL	PUT DOWN 100 LBS OF SPILL GONE	P.W.
10/12/2005	freightliner dr	oil spill	put down absorbent	pd, pw
10/18/2005	caruthers st @ s.6th st	blood spill	washdown w/bleach & water solution	pd, pw
10/27/2005	dickerson pk @lorraine (mapco express)	fuel spill	covered with spill gone 100lbs	pw
11/10/2005	dickerson pk @ briley pkwy	diesel & oil spill	put down 200 pounds of spill gone	pw, fd, pd
11/21/2005	madison st @ 6th av n	diesel spill	covered with spill gone. Approx 200lbs	pw,pd,fd
12/16/2005	whites creek @ greenbriar	oil spill	used 200lbs of spill gone to cover spill	pd, pw, state trooper
12/26/2005	lewis st to lafayette	oil spill	used 300lbs of spill gone to absorb oil off ground	pw
01/01/2006	I-65 &harding pl	diesel spill	used spill gone to cover spill	pw
01/19/2006	south fifth st	diesel spill	put down absorbent-and requested storm water rep	ofm, pw, storm water
01/20/2006	DOUGLAS @ DICKERSON	DIESEL SPILL	USED 200 LBS OF SPILL GONE TO COVER APPROX. 15 GAL DIESEL	P.D./ P.W./ F.D.
01/25/2006	44th av n & tennessee av	hydraulic spill	cleaned up with spill gone	pw, sanitation department
02/01/2006	brick church pk @ fern ave	oil spill	blocked off road at all 3 intersections with help of mpd. And used 1500lbs of spill gone	pw, pd, fd
02/07/2006	ellington pkwy @spring st	fuel & hydraulic spill	put 950lbs of spill gone and swept up with sweeper truck	pw,fd,pd,ofm,sanitation
02/09/2006	napoleon av @ canady av	hydraulic spill	used 100lbs of spill gone & 75 absorbent pads	pd,pw
02/11/2006	james robertson pkwy @ I-24	diesel spill	used spill gone to cover spill	pw,fd
02/22/2006	charlotte pk @ 11th av n	oil spill	used 1500lbs of spill gone	pd, fd, pw
03/02/2006	26th av n @ clarksville pk	transmission fluid spill	used 250lbs of spill gone	pw
03/12/2006	I-440 @NOLENSVILLE	DIESEL SPILL	USED 175 LBS OF SPILL GONE TO COVER SPILL	P.W. / PD / A.B. COLLIER
03/18/2006	3612 BENTFIELD DR	OIL SPILL	USED 200 LBS OF SPILLGONE	PW
03/20/2006	DONELSON @ HADLEY	DIESEL SPILL	USED SPILL GONE TO COVER SPILL. USED 450 LBS	PW
03/22/2006	19th AV. N. @ HERMAN ST.	HYDROLIC SPILL	USED 250 LBS OF SPILLGONE TO COVER	PW/METRO WATER
04/22/2006	MILE MARKER 209 I-40 WEST	DIESEL SPILL	AND WAS CLEANING IT UP	P.W./ T-DOT/ WEST NASHVILLE TOWING
05/13/2006	I-40W @ MILE MARKER 218 (DONELSON PK.)	OIL SPILL	USED SPREADER TRUCK AND APPROX. 300 LBS SPILL GONE TO COVER	PW/ FD/ PD
05/19/2006	3020 GALLATIN PK	OIL SPILL	USED 250 LBS OF SPILL-GONE	PW
06/05/2006	4th ave n at charlotte ave	hydraulic fluid spill	put down 200 lbs of absorbent	public works
06/24/2006	1120 LITTON AV.	GAS (FUEL) SPILL	USED 3 LBS SPILL GONE TO COVER	PW

Industrial Inspections SOP

M1

1. Before Inspection:
   a. Review Cycle 1 database to reference previous inspections and problems.
   b. Review following links to see if any other information is available:
      i. OSHA – search for any reported incidents for the site and to find site SIC code.
      ii. TDEC Permits – see if site has stormwater permit (multisector/individual)
      iii. If possible, review the TMSP permit for the identified industry sector
   c. Call ahead and make an appointment to inspect the facility (hopefully, within a week of planned inspection).
      i. Specify in the phone conversation to have all TDEC permit related documentation (SWPPP, Sampling Records, Inspection forms, etc.) ready for review.
      ii. If site refuses to allow inspection, contact TDEC (615) 687-7000) for co-inspection.
   d. Make sure you have the following information:
      i. Metro Identification,
      ii. "Opening Meeting Questions" and "Inspection Form", and/or
      iii. Safety Equipment (hard hat, steel toed shoes, safety glasses, safety vest, and air meter).
   e. Obtain copy of GIS map of site address that illustrates if the site drains into MS4, CSO, etc.
2. During Inspection:
   a. Conduct opening meeting asking the set of prepared questions.
   b. Obtain map of facility from personnel if indicated one would be available during the initial phone call.
   c. Tour facility with the plant personnel.
   d. Look for deficiencies, some of which include:
      i. Chemical storage (inside vs. outside)
      ii. Spill clean-up and response kits
      iii. Exposed tanks - make sure valve's in secondary containment are closed
      iv. Exposed dumpster – make sure drain plug is shut
      v. Drain plumbing – make sure that all drain pipes are connected to the proper destination (sanitary vs. storm sewer), and/or
      vi. General illicit discharges
      (Note: during inspection pay close attention to loading, cleaning, and storage areas)
   e. Determine if sampling would be needed, if so follow sampling guidelines.
   f. Educate personnel on areas where water quality could be improved.
   g. Document inspection through comments/notes on inspection report and discuss comments with the operator. Discuss and try to agree to a timetable for any improvements that are to be implemented.
3. After inspection:
   a. Within 10 days of the inspection, send a follow-up letter that contains noted deficiencies and suggested remedies. Always include hard deadline in letter. (Copy TDEC designated representative on letter via email)
   b. Document notes in the database. Link follow-up letter.
      i. If issues remain unresolved or if sites need to be inspected again by the end of the permit cycle, leave record active in the database; however, if there are no issues click the archive button.
   c. Follow-up with facility contact until site is in compliance as early as possible and at least by end of Permit Year 5. Coordinate with TDEC, if necessary.
   d. If it is noted that stormwater runoff issues exist on the site and they do not have a TN Multisector Permit (TMSP), notify TDEC Division of Water Pollution Control.

Industrial Inspections Opening Meeting Questions

Date:_____

ATTENDEE NAME	COMPANY/TITLE	PHONE

1. What does the facility do or produce? What are the basic raw materials involved? What are the major manufacturing processes?

2. How many shifts do they operate? **1 2 3** How do they handle environmental issues on the 2nd and 3rd shifts?

3. How many storm water outfalls do they have? Where are they located? How often are the outfalls inspected?

4. Are there any roof drains, and do they inspect and/or clean the roof?

5. How many dumpsters are on the site? Are the dumpsters covered and plugged and is the area around the dumpster inspected?

6. Is there an up to date SWPPP for the site? **Y N** Have the Quarterly Inspections been performed? **Y N**
   Is sampling required by the TMSP permit? **Y N** Are sampling records present from the past three years? **Y N**
   Are any of the sampling results over the permit cut-off concentrations? **Y N**
   Has the facility performed an annual site compliance inspection? **Y N** Is there a non-storm water certification? **Y N**

7. Are there any outside storage tanks? **Y N** Do they have secondary containment? **Y N**
   What materials are stored in the outside tank(s)?

8. Are there any detention ponds or treatment structures? **Y N** How often are they inspected/monitored?

9. Where are inside floor drains and do they connect to the sanitary sewer? **Y N Unknown**

10. Have there been any spills within the last 10 years? If so, when, what, and how much spilled and was it remediated? **Y N**

Industrial Inspection Report Checklist

Date:_____/Time:_____

Facility Name

Street Address

City

ZIP

Contact Name

Contact Phone

SIC

Watershed

Industrial Type

Storage **Tanks/Barrels:**

Equipment:

Loading

Drains **Storm:**

Roof:

Floor:

Dumpsters

Outfalls: **Odor:**

Color:

Foam:

Erosion

Pond

Other

Is Reinspection Necessary? Circle One: Yes No

Industrial Inspection Database Status

Facility	Sector	Date of Inspection	SIC Code
SPRINGS INDS. INC. BATH FASHIONS DIV.		6/03/04	2273
REDDY ICE NASHVILLE		7/14/04	2097
MARCUS PAINT CO.	C	07/26/04	2851
NORTH AMERICAN GALVANIZING CO. NASHVILLE	AA	07/26/04	3479
MARATHON ASHLAND PETROLEUM L.L.C.	P	08/26/04	5171
AFL WIRE PRODS. NASHVILLE	F	9/22/04	3357
AFL WIRE PRODS. NASHVILLE	AA	9/22/04	3357
DU PONT OLD HICKORY PLANT	C	09/30/04	2297
Building Materials Manufacturing (GAF)	E	10/15/04	3229
FERRO CORP. (International Paints)	C	10/15/04	2851
NASHVILLE WIRE PRODS.	AA	11/04/04	3471
IMI (Irving Materials Reddy Mix)	RMCP	11/10/04	3273
BP NASHVILLE TERMINAL	P	11/19/04	5171
CONE SOLVENTS INC.		11/23/04	5169
NASHVILLE CHEMICAL & EQUIPMENT CO. INC.		11/24/04	2816
Aerostructures (Vought Industries)	Individual	12/01/04	3728
National Linen Service		12/08/04	3582
CUMBERLAND TERMINALS INC.	P	12/13/04	5171
Chemrock		12/16/04	3295
THERMAL ASH PHASE 3		1/18/05	
BRUCE HARDWOOD FLOORING L.P. NASHVILLE PLANT	A	01/19/05	2426
RHODIA INC. (Innophos)	C	01/19/05	2819
MID SOUTH WIRE	F	04/20/05	3479
Quality Plating	AA	04/26/05	3471
Pepsi Cola	P	05/24/05	2086
MEGUIAR'S INC.	C	06/08/05	2842
PURINA MILLS L.L.C.	U	08/03/05	2048
PURITY DAIRIES INC.	U	08/11/05	2024
Lawson Ready Mix	RMCP	12/29/05	3273
Metro Reddy Mix - Vulcan Quarry	RMCP	01/11/06	3273
ALLADIN TEMP RITE		02/09/06	3089
Metro Ready Mix Concrete	RMCP	02/09/06	3273
ASHLAND DISTRIBUTION CO.	P	03/03/06	5169
Nashville Ready Mix	RMCP	03/07/06	3273
Reostone Quarry	Mining	05/10/06	1442
ERGON TERMINALING INC. NASHVILLE	P	05/25/06	2951
IKG INDS		06/01/06	3446
THOMAS NELSON INC.		06/08/06	2731
EXXON MOBIL CORP. NASHVILLE TERMINAL	P	06/27/06	5171

Facility	Sector	Date of Inspection	SIC Code
WARREN PAINT & COLOR CO.	C	06/28/06	2851
SAFETY-KLEEN CORP. 3-109-01	K	06/29/06	7399
VISTEON CORP. NASHVILLE GLASS PLANT	Individual	06/30/06	3211
APAC NASHVILLE CITY ASPHALT PLANT (Lojac)	D	7/20/2006	2951
WHIRLPOOL CORP.	AB	8/1/2006	3585
KOHL & MADDEN (Sun Chemical	C	8/25/2006	2893
A. SCHULMAN INC. NASHVILLE PLANT		8/29/2006	3087
Advanced Plating Inc.	AA		3471
COUNTRY DELITE FARMS			
Eagle Ready Mix	RMCP		3273
Emmanuel Stained Glass Studios Inc.			3231
HARCROS CHEMICALS INC.			5169
HARPER INDUSTRIES (NASHVILLE PLANT 1)			
IBP INC. GOOGLETTSVILLE			2013
IMI - Park Drive	RMCP		3273
IMPERIAL ADHESIVES INC.			2891
INGRAM INDUSTRIES (NASHVILLE PLANT 2)	J		4449
JOHN P SAAD & SONS, INC.			48411
KEY OIL CO.	P		5171
LAMBS CLEANERS			7218
LION OIL COMPANY	P		42271
Metalworking products	AB		3545
METROPLEX LIMITED			335221
MID-STATE PLATING	AA		332813
Nashville Ready Mix	RMCP		3273
NASHVILLE TN TERMINAL	P		
NATIONAL PAINT & COATINGS CO.	C		2851
NORTH AMERICAN COMPOSITES	C		5169
ODOM'S TENNESSEE PRIDE SAUSAGE INC.	U		2011
OUIMET CORP.			2295
PERFECTION MOULDERS INC.	F		3365
PETERBILT MOTORS CO.	AB		3711
PORTION PAC			9999
QUEBECOR WORLD RETAIL GROUP			2752
SERVICE PAINT & COATINGS CO. INC.	C		2851
U.S. SMOKELESS TOBACCO MFG. L.P.			2131
U.S. TVA Pinhook 500 KV Substation			

List of Industrial Sites That Will Be Prioritized in Permit Year 4

Facility Name	Watershed
A. SCHULMAN INC. NASHVILLE PLANT	SEVENMILE CREEK
IBP INC. GOOGLETTSVILLE	MANSKERS CREEK
IMPERIAL ADHESIVES INC.	RICHLAND CREEK
HARCROS CHEMICALS INC.	MILL CREEK
OUIMET CORP.	BROWNS CREEK
PERFECTION MOULDERS INC.	MANSKERS CREEK
QUEBECOR WORLD RETAIL GROUP	EWING CREEK
WHIRLPOOL CORP.	STONES CREEK
KOHL & MADDEN (Sun Chemical)	MILL CREEK
NATIONAL PAINT & COATINGS CO.	SEVENMILE CREEK
SERVICE PAINT & COATINGS CO. INC.	STONES CREEK
EMMANUEL GLASS AND STUDIO Inc.	MILL CREEK
METALWORKING PRODUCTS	STONES CREEK
U.S. TVA PINHOOK 500 KV SUBSTATION	STONES CREEK
EAGLE READY MIX	STONES CREEK
JOHN P SAAD & SONS, INC.	SEVENMILE CREEK
LAMBS CLEANERS	PAGES BRANCH

Note: This list was sent to TDEC at the end of Permit Year 3 to coordinate future inspections in permit year 4.

FOG Program Grease Interceptor Certification Form (Page 1)

GREASE INTERCEPTOR CERTIFICATION (Form A)

Every food service establishment in the Metro Nashville Department of Water & Sewerage Services' area must have their grease interceptor inspected annually, as required by their FOG permit, to verify that all components of the grease control equipment are present and in good working condition. Furthermore, the inspection will identify any structural problems with the grease interceptor.

Facility Name:_____ Phone #:_____

Address:_____ City:_____,TN. Zip Code_____

	PASS	FAIL*
1. Interceptor completely emptied and cleaned before inspection?	☐	☐
2. There is access to all interceptor chambers for cleaning and inspections?	☐	☐
3. Influent (inlet) T is attached and extends downward at least 2/3 depth of tank?	☐	☐
4. Effluent (outlet) T is attached and extends downward to within 12" of tank bottom?	☐	☐
5. Effluent (outlet) T is made of non-collapsible material that does not easily flex or bend (i.e. minimum- schedule 40 PVC, etc.), and is secure, not allowing fats, oils or grease to escape around edges?	☐	☐
6. Interceptor tank does Not have visible holes or leaks?	☐	☐
7. Mid-wall baffle(s) is secure and operational?	☐	☐
8. Interceptor maintaining structural integrity?	☐	☐
9. No Sewer clean-out covers missing or damaged?	☐	☐

*** IMPORTANT REQUIRED INFORMATION & RESPONSE: If the answer to any of the above questions is "Fail", the equipment has failed certification. A statement of the plan of action to be taken, with date to be completed, needs to be provided on the attached sheet under "Response Comments" (attach additional sheets to explain corrective action if necessary):**

Inspector Certification **– This grease interceptor has ☐ PASSED ☐ FAILED certification.**

I _____ of _____
(print name of inspector) *(print company name)*
certify that the above listed facility has an approximate _____ gallon capacity interceptor. I have examined the interceptor and provided the above information.

_____ _____ _____
(signature) *(date)* *(phone number)*

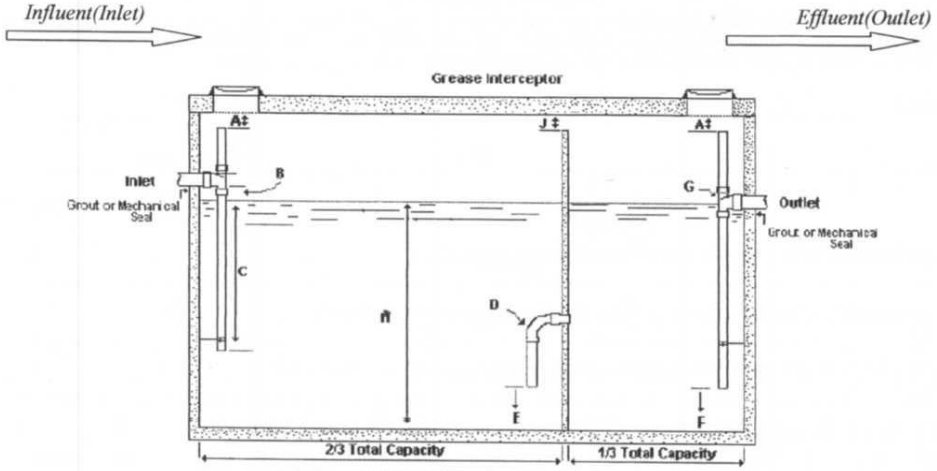
Facility Owner/Manager Certification

I _____ certify to the best of my knowledge the above
(print name)
statements to be true and correct. _____ _____
(signature) *(date)*

SUBMIT ***ORIGINAL*** *CERTIFICATION FORM TO:*
Metro Water Services, FOG Control Program, 1607 County Hospital Road, Nashville, TN 37218

FOG Program Grease Interceptor Certification Form (Page 2)

Grease Interceptor Diagram



A.) Minimum 6", but not less than pipe diameter.
B.) Inlet pipe invert to be 2 1/2" above liquid surface.
C.) Inlet pipe to terminate 2/3 depth of water level.
D.) 90 degree Sweep, minimum size - 6".
E.) 12" from floor to end of sweep.
F.) 12" from floor to end of outlet pipe.
G.) Outlet pipe no smaller than inlet pipe, minimum - 4".
H.) Minimum depth of liquid capacity - 42".
J.) Maximum distance from ceiling - 6".

RESPONSE COMMENTS (required if "Fail" checked, identify problem, corrective action and provide planned date of corrective action)

FOG Program Grease Trap Certification Form (Page 1)

GREASE TRAP CERTIFICATION (Form B)

Every food service establishment in the Metro Nashville Department of Water & Sewerage Services' area must have their grease trap (under-the-sink units) inspected annually, as required by their FOG Permit, to verify that all components of the grease control equipment are present and in good working condition.

Facility Name:_____ Phone #:_____

Address:_____ City:_____,TN. Zip Code_____

	PASS	FAIL*
1. Grease trap completely emptied and cleaned before inspection?	☐	☐
2. There is access to all trap chambers for cleaning?	☐	☐
3. Flow restrictor device is installed (before grease trap or at grease trap inlet)?	☐	☐
4. Flow restrictor device installation is correct (proper flow direction and orientation)?	☐	☐
5. Grease trap is vented (vent on flow restrictor)?	☐	☐
6. Grease trap has NO visible holes or leaks?	☐	☐
7. Baffle(s) (inlet, middle and outlet…depending on design) are secure and operational?	☐	☐
8. Automatic or machine dishwasher is NOT connected to the grease trap?	☐	☐
9. No Sewer clean-out covers missing or damaged?	☐	☐

*** IMPORTANT REQUIRED INFORMATION & RESPONSE: If the answer to any of the above questions is "Fail", the equipment has failed certification. A statement of the plan of action to be taken, with date to be completed, needs to be provided on attached sheet under "Response Comments" (attach additional sheets to explain corrective action if necessary):**

Inspector Certification - This grease trap has ☐ PASSED ☐ FAILED **certification.**

I _____ of _____
(print name of inspector) *(print company name)*

certify that the above listed facility has a _____ gallons per minute / _____ pound capacity grease trap. I have examined the grease trap and provided the above information.

_____ _____ _____
(signature) *(date)* *(phone number)*

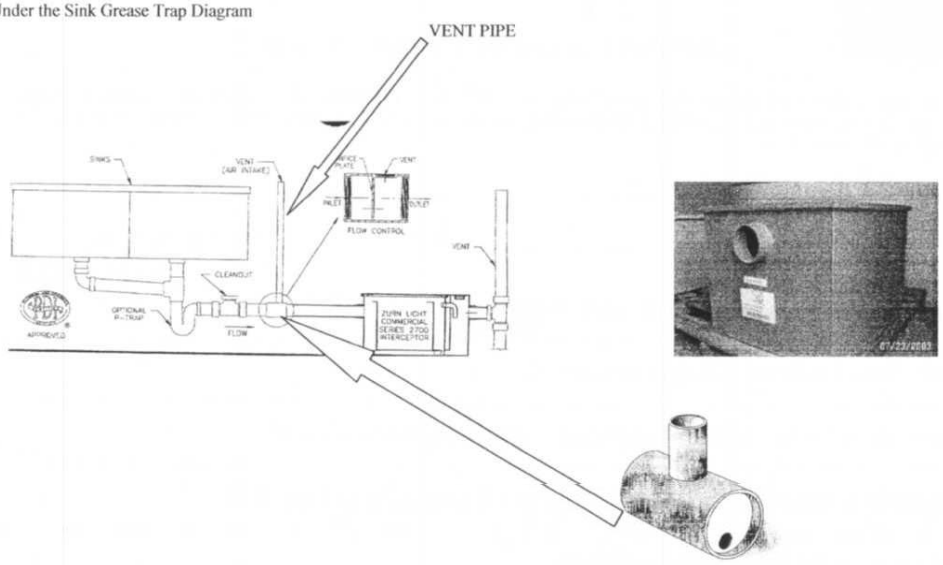
Facility Owner/Manager Certification

I _____ certify to the best of my knowledge the above
(print name)
statements to be true and correct. _____ _____
(signature) *(date)*

*SUBMIT **ORIGINAL** CERTIFICATION FORM TO:*
Metro Water Services, FOG Control Program, 1607 County Hospital Road, Nashville, TN 37218

FOG Program Grease Trap Certification Form (Page 2)

Under the Sink Grease Trap Diagram



FLOW RESTRICTOR (Key component)

RESPONSE COMMENTS (required if "Fail" checked, identify problem, corrective action and provide planned date of corrective action)

Metro Water Services
System Services Division
Sewerage Spills and Overflow Incidents
Guidelines & Procedures

GOAL

To reduce or eliminate the public health risks and environmental damage associated with illicit discharges from the public collection system.

Metro Water Services - System Services Division

Collection System Sewerage Spills and Overflow Incidents Guidelines and Procedures

System Services is staffed 24/7/365 to respond to any public health or environmental problem related to an illicit discharge of sanitary sewage. The following guidelines and procedures address the manner in which these incidences are to be handled by System Services' employees.

Definition of Discharge Point: ***Any point in the public collection system where sewage is discharged on to roadways, public and private property, or directly or indirectly into creeks or rivers.***

GUIDELINES

When notified of an overflow from the public collection system, remember the following:

1) **Containment**
2) **Contact**
3) **Cleanup**

Containment

(a) Upon arriving at the discharge site, immediately proceed with measures to stop the discharge of sewage. If discharge cannot be stopped, notify supervisor for additional equipment/resources as required. Proceed to (b).

(b) Barricade, flag, or hazard tape the affected area to minimize potential contact with the public.

Contact

(a) Contact the SSD Dispatch to report the following information:
- exact location and condition of site
- public or private collection system
- all contractors or construction work observed in area

(b) Document this information, as well as the cause of the blockage (roots, grease, etc.) on the Work Order.

(c) If the public collection or private system overflow is near or in a creek or river, contact the on-duty supervisor. The on-duty supervisor will immediately contact the MWS NPDES division for remediation advice and guidance. The responding supervisor is also responsible for ensuring that an Overflow Notification Form is completed and faxed to the Division of Water Pollution Control (TDEC) and Metro Stormwater - NPDES Division within 24 hours.

State of Tennessee Water Quality Division
ATT: Ann Rochelle: ….……...Fax: 687-7078
Office Number: ….……..…….. 687-7123

Joey Holland ….…….687-7020

Metro Stormwater - NPDES Division
ATT: Michael Hunt ….……..Fax: 880-2425
Office Number ….…….... 880-2420

Cleanup

(1) For inline sewer stoppage (grease, roots, or debris), clear blockage as soon as possible.

(Note: If stoppage cannot be cleared quickly, pump crew shall connect a by-pass line either directly into a tanker truck or into public sanitary sewer until blockage has been cleared.)

(2) Make every effort to contain surface discharge drainage. Call dispatcher for any assistance needed. Sandbag or trench away from catch basins and drainage ditches and creeks or rivers. A construction repair crew with backhoe may be needed in large spills. Make every effort to isolate discharge to the site. If the discharge is in a CSO system, sewage can be washed into the collection system.

(Note: Notify affected property owners as soon as possible of incident and corrective action being taken.)

(3) If possible manually remove sewerage debris from discharge point and transport to compost lot for processing to landfill. This includes all solids that were discharged from our sewer system. This will decrease the aesthetic impact at the discharge point.

(4) If overflow has entered a creek or river (or has potential to) the on-duty supervisor shall consult with MWS NPDES personnel in order to collaboratively identify the scope of the cleanup effort.

Metro Stormwater - NPDES Division
Michael Hunt ….……. 880-2420
Mike Seremet …..533-0334……Direct Talk #82
Butch Bryant…..566-3865……Direct Talk# 193

(5) Do not wash down discharge that could drain into nearby catch basins, ditches or creek beds. Note: If spill is directly in creek or drainage bed, remove all sewerage debris from creek bed using a vacuum truck to recover as much as possible. Utilizing input from the TDEC and MWS NPDES Division, an on-site decision will determine if it is appropriate to flush streambed. If the damming of stream channel is required, only sandbagging for containment will be approved and complete removal of sandbags will be required. If in the event of a broken sandbag, all loose sand will be removed from stream channel. Note: Due to Federal regulations, do not use city water to clean creek bed. Non-chlorinated water can be brought in to use in the event of a large spill. Non-chlorinated water can be obtained at Central, Dry Creek and Whites Creek Wastewater Treatment Plants. The department is in the process of securing Chlorine Defuser's for available public water use as needed. Never use high-pressure (jet) water for creek or drainage bed cleanup due to potential soil erosion or danger to aquatic life.

(6) If a creek, river or other waterbody has been impacted by sewerage, dissolved oxygen levels should be monitored and observations made to determine if fish or other aquatic life have been killed. Death of fish and aquatic life may not result until several hours or the next day following the discharge into the stream, after oxygen depletion occurs due to breakdown of the sewage through natural process. Monitoring results and any observations made should be included in the report submitted to the Division of Water Pollution Control describing the overflow incident. In the event that fish or other aquatic life have been killed, the Tennessee Division of Water Pollution Control should be notified as soon as possible, but no later than 24 hours following discovery of the incident. Division personnel can be contacted through the Tennessee Emergency Management Agency (TEMA) at 741-0001 if the fish kill occurs after regular business hours, on holidays, or on weekends.

NOTE: Water samples taken by Metro Water Services or other approved agencies above and below discharge point will determine whether the clean-up is complete or further action is required

Lime and disinfectant may be used around discharge points in isolated grass areas and under homes, if needed, upon agreement of property owner. *Do not use lime or disinfectant in creek or drainage beds.*

If the discharge point is the result of a sewer segment failure by either natural causes or actions of others, start by-pass pumping to public sanitary sewer as soon as possible. If contractor on site is responsible and cannot start by-pass pumping in a timely manner, call dispatcher for MWS pump crew. Note: If caused by others, this work can be billed back to the responsible parties. If possible have jet-vacuum truck keep sewerage confined to collection system while this by-pass pumping is being put in place. Take every possible action to confine sewer discharge to site.
Air-Relief Valves on Sewerage Force-Mains Discharge

If the discharge point is the result of a faulty or broken air-relief valve, contact the System Services supervisor. The SSD shop is responsible for maintenance and repair of these valves. A jet-vacuum truck can, in most cases, keep sewerage confined to the air-relief valve manhole. Take every possible action to reduce discharge at site until repair personnel arrive on site.

Sewer Pumping Station Discharge
In the event the sewerage discharge point is from a MWS sewer pumping station, contact the Control Room at Omohundro Water Plant (862-4978) or Direct Talk #200.

CSO Regulator Manhole Discharge
System Services Division maintains CSO Regulators and in the event of a system failure should be handled as a collection system stoppage. Electronics at all facility are maintained by Operations. If you are at a CSO Regulator and were not dispatched by Operations, please notify them of your presence to clarify any electronic alarms they may receive for this site.

Private System Discharge
If the sewage discharge is located on a private system, make every effort to bring it to the owner's attention. Inform responsible party of the public health and environmental concerns and that Metro Stormwater - NPDES Division and Metro Public Health will be notified of discharge.

Appendix B

Public Education

Public Education/Outreach by NPDES Staff

Date	Forum/Outreach Group	Title/Description of Outreach	Presenter	Number of Attendees
6/23/2006	Lorman Stormwater Professionals	Latest issues in stormwater qulity	Michael Hunt	35
6/22/2006	All Metro Departments	MS4 Permit Orientation	Josh Hayes, Michael Hunt, Steve Winesett	32
5/12/2006	Richland Creek Area Home Owner's Association	Metro Nashville's Stormwater Management Program and how citizens can get involved	Preston Winesett	10
5/12/2006	ICEA Muddy Water Blues Conference	Metro Nashville's Revised Stormwater Manament Regulations	Michael Hunt	40
4/21/2006	Tennessee AWRA Symposium	Metro Nashville's Watershed Management Plan	Preston Winesett	40
3/28/2006	New Stormwater Regulations and Water Quality Tool training of Stormwater PRS	New Regs and Water Quality Tool Training	Rebecca Dohn	9
3/23/2006	TDEC Level One Erosion Control Workshop	Grading Permit Process and Erosion Control in Davidson County	Dale Binder	150
3/3/2006	Tennessee Lawn and Garden Show	Native tree plantings for stream buffer restormation (gave out 150 native trees)	Josh Hayes, Steve Winesett	150
2/8/2006	Nashville South Kiwanis	NPDES Water Quality Program	Michael Hunt	20
1/28/2006	Edmondson Pike Library Tree Planting	Public Education on Buffer Vegetation and Water Quality	Josh Hayes/Sonia Harvat	30
1/26/2006	Cumberland River Compact Educational Seminar	Stream Buffers and Restoration	Michael Hunt	40
1/19/2006	CRC-BOB	Watershed Management Plan	Steve Winesett	25
12/5/2005	TDEC/EPA Overflow/TDEC Presentation	An overview of Water Services controls aimed at reducing sanitary overflows and improving water quality	Michael Hunt, Steve Winesett	10
12/7/2005	TDEC Level One Erosion Control Workshop	To discuss Erosion Control Requirements in Nashville, Davidson County	Dale Binder	120+
11/25/2005	General Public	Cycle 2, Permit Year 2 Annual Report posting to Website	Josh Hayes	N/A
11/14/2005	Construction General Permit Taskforce	Gave Metro's grading permit overview to taskforce	Michael Hunt	75
9/20/2005	TDEC Level One Erosion Control Workshop	To discuss Erosion Control Requirements in Nashville, Davidson County	Dale Binder	100+
10/20/2005	TDEC EAC	Thermograph Study	Steve Winesett	6
9/21/2005	TDEC/EPA	Watershed Management Plan	Steve Winesett	35
7/27/2005	Madison Kiwanias Club	NPDES Program Presentation	Michael Hunt	30

Stormwater BMP Notification Flyer

NOTICE

METRO WATER SERVICES

Stormwater NPDES Division

Making a Difference in Water Quality & Quantity:

- Our records indicate that the listed address contains a stormwater **Best Management Practice (BMP)** structure that requires routine inspection/maintenance. A stormwater BMP structure may consist of an underground structure, grass filter swale, inlet filter, and/or a detention pond. These structures are designed to detain/filter stormwater runoff for purposes of improving water quality and controlling water quantity runoff.
- Per Metro regulations, BMPs are required to be inspected and maintained by the owner or operator of the property. BMPs that are not properly maintained could lead to an increased risk of flooding, decreased quality of stormwater runoff, standing water and mosquito breeding habitat, increased long-term maintenance costs, and many other preventable stormwater issues.
- Per State Regulations, Metro is required to verify that all BMPs within Metro's jurisdiction are being adequately maintained and is obligated to enforce on structures that are not being maintained. At some point, Metro will be inspecting the BMP located within your property. Complications with Metro inspections could be avoided if you take the appropriate actions to institute a routine BMP inspection/maintenance schedule. The initial part of BMP maintenance includes initiating a routine inspection program. At a minimum, the BMP should be inspected semi-annually and after any major storm event. For questions about what type of BMP is located at your facility call 615-880-2420 and reference the number in the bottom left corner of the envelope.

Items to inspect for and maintain for BMPs:

Pond/Filter Swale
- Excessive Vegetation Growth
- Sediment accumulation
- Eroding and/or exposed soils
- Ponding of water for more than 72 hours after a rain event
- Outlet structure clear of debris/litter

Underground Structure/Inlet Filter
- Accumulation of debris/trash
- Accumulation of sediment
- Opening accessibility
- Clogged filters allowing water to bypass

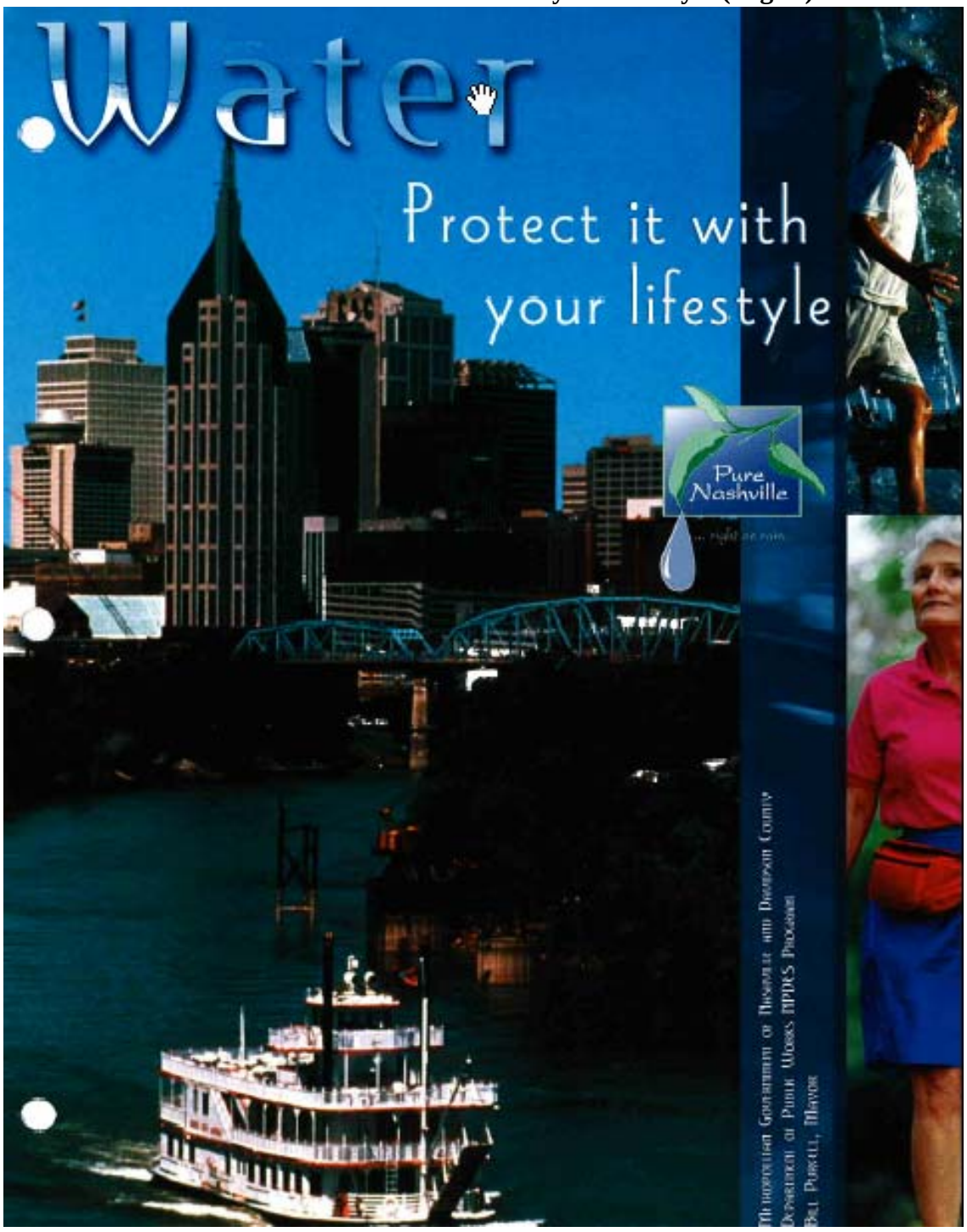
Well-maintained Detention Pond

Well-maintained Underground Structure

Poorly-maintained Detention Pond

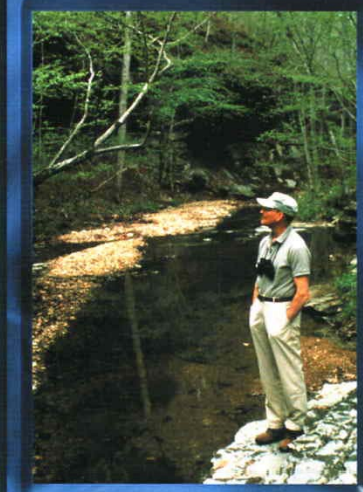
Poorly-maintained Underground Structure

Brochure: Water – Protect it with your Lifestyle (Page 1)



Brochure: Water – Protect it with your Lifestyle (Page 2)

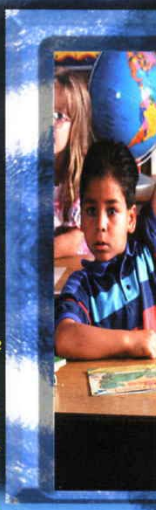
The Clean Water Challenge



According to the Environmental Protection Agency, the primary cause of water quality problems in the U.S. today is not from factories or waste-water treatment plants, but rather something called "nonpoint source pollution." Nonpoint source pollution is runoff from rainfall, snowmelt, or irrigation that picks up soil and contaminates as it runs over land or under ground, eventually depositing them into surface waters or introducing them into ground water.

To address specifically the problem of pollution from storm water runoff, industries and municipalities across the nation are being required to obtain National Pollutant Discharge Elimination System (NPDES) permits. The Tennessee Department of Environment and Conservation, under the direction of our nation's Clean Water Act, issued an NPDES permit to Davidson County, making us responsible for improving and protecting the quality of water allowed to enter the "Waters of the State." This means that any ditch, culvert, or conveyance that routes water to area streams and rivers must be kept free of pollutants.

What Metro [illegible] is Doing



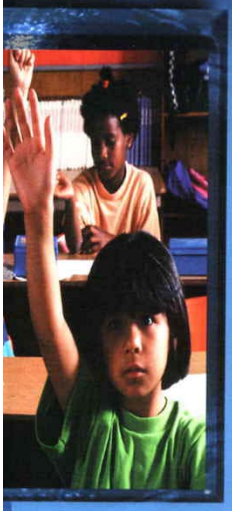
In Metropolitan Nashville/Davidson County, storm water that flows into drainage ditches, gutters, and storm drains is not treated before it makes its way into our waterways. As a result, the products of our everyday activities – oil and gasoline, litter, pet wastes, pesticides, fertilizers, wash water, even soil and yard clippings – get swept up in storm water and become pollutants that can kill aquatic life, limit the use of our waters for recreational and other purposes, and create eyesores. More than half of the contamination in our waterways today is caused by storm water pollution.

The goal of the Metropolitan Government of Nashville and Davidson County (Metro) NPDES permit is to develop and implement storm water pollution controls that will make our waterways "fishable, swimmable, and environmentally safe." As part of this effort, the Department of Public Works has in place a multifaceted storm water management program that addresses:

CONSTRUCTION: We encourage and enforce proper erosion control measures at construction sites.

Brochure: Water – Protect it with your Lifestyle (Page 3)

ASHVILLE



SPILL RESPONSE: Metro has an established hazardous materials spill response plan that minimizes damage to the environment.

INDUSTRIAL INSPECTIONS: We are providing ongoing inspection and/or monitoring of local industries for environmental compliance.

MONITORING: We regularly monitor the water quality of our local streams/watersheds.

ROADWAYS: We are increasing street sweeping efforts and are utilizing more efficient, environmentally friendly road salting methods.

ILLICIT DISCHARGE AND DUMPING: We are identifying illegal discharges to our storm water conveyances and enforcing discharge regulations.

PUBLIC EDUCATION: We are developing and carrying out programs and methods to educate the public and industries on storm water-related environmental issues.

PUBLIC REPORTING: We provide a storm water pollution telephone hotline (313-PURE) for reports related to any discharges or activity that is contributing to water pollution. An inspector follows up on all notifications.

INFRASTRUCTURE: We have inventoried and documented the location and condition of the county's storm water drainage system.

DEVELOPMENT/ REDEVELOPMENT: We consider, implement, and encourage best management practices to minimize negative environmental impacts from storm water runoff.

Healthy lakes, rivers, and streams directly impact property values and the quality of life we enjoy. Each of us has a responsibility to be a part of Metro's pollution solution by controlling what we purposefully and inadvertently put down our storm drains. This responsibility begins by understanding where pollutants come from. For example, many common household products - such as oven cleaners, paint and paint removers, cleaning fluids, and moth balls - and motor oil contain toxic ingredients that can become a threat to public health and the environment if not properly used or discarded. Wash water contains detergents, oil, grease, metals, dirt, and other pollutants released by the washing process. Fertilizers and pesticides washing off our lawns can deplete lakes and rivers of oxygen needed by aquatic life and wildlife. Even waste from the family pet can contain bacteria and viruses that contaminate waterways.

By following the suggestions on the back of this publication, you take an important step in helping to clean up our waterways and assist Metro in meeting its NPDES permit requirements.

Brochure: Water – Protect it with your Lifestyle (Page 4)

Minimizing Storm Water Pollution: What You Can Do

AROUND THE HOME

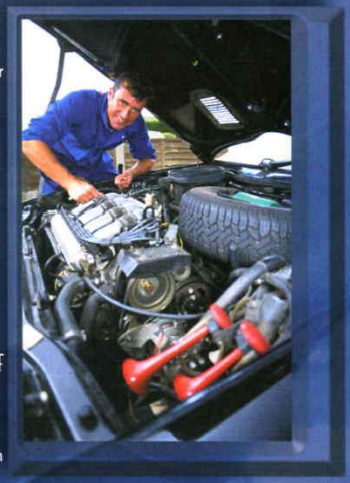
- Use household cleaners that are labeled nontoxic and biodegradable, and use the smallest quantity possible.
- Properly use and store all toxic products, including cleaners, solvents, and paints. Clean up spills immediately. Follow label directions regarding container disposal or take to a local collection site.
- Recycle reusable materials, and throw litter into trash cans that are tightly covered.
- Dispose of paint in an enviromentally friendly manner. For disposal methods, visit www.nashville.org/pw/paint.html or call 615-862-8620.

IN THE YARD

- Use pesticides, herbicides, and fertilizers sparingly and in accordance with label instructions. Do not apply if rain is expected or near ditches, gutters, or storm drains. Use products labeled nontoxic, biodegradable, or water-soluble when possible.

- "Go natural" by using natural fertilizers such as compost or bone meal and natural insect repellents, such as marigolds (for nematodes and white flies), soapy water from dishes (for flowers and roses), or spearmint gum (for moles).
- Do not over irrigate - this can cause sediment to wash into storm drains.
- Do not blow, sweep, or rake leaves or grass clippings into gutters or storm drains. Compost yard waste or bag and dispose using solid waste collection programs.
- Divert rainspouts and garden hoses from paved surfaces onto grass.
- Pick up animal wastes and dispose of in garbage cans or by flushing down toilets.

VEHICLE- AND BOAT-RELATED ACTIVITIES



- Take used motor oil to a participating oil recycling center. For a list of centers and to find out how to dispose of antifreeze, transmission fluids, engine cleaners, and battery acid, call 615-862-8620 or visit our web site.
- Properly maintain your car or boat to reduce the leakage of oil and other fluids.
- Wash cars on lawns or ground rather than paved surfaces to minimize runoff, and use biodegradable, nonphosphate soap.
- Use marine sanitation devices or pump-out facilities to get rid of boat sewage.
- When spills occur, use kitty litter, sawdust, or wood chips to soak up fluid and dispose in garbage can.

GENERAL

- Report illicit discharges or illegal dumping into storm drains by calling Metro's storm water pollution hotline at 615-313-PURE.
- For more information about Metro's solid waste collection programs, please call 615-862-8620.

Metro Water Services NPDES Program

1607 County Hospital Road
Nashville, TN 37208
Stormwater Pollution Hotline: (615) 313-PURE
www.nashville.gov/stormwater

Bill Purcell, Mayor

If you need any assistance or accommodation(s), please contact Mr. Joseph A. Estes, Sr., Metro Water Services, ADA Coordinator, 1600 2nd Avenue North, Nashville, TN 37208-2206; telephone 615-862-4862.

Metro Parks Brochure on Pet Waste Clean-up

metro parks

Fun With Your Dog!

Nashville's Canine Clean-Up Campaign - The Tail of a Clean City

Residents of Davidson County, as with most other areas of the nation, are crazy about their dogs! The Shelby Dog Park is the first project that the Department has launched to fill a void for our furry friends. No one could have anticipated the enormous popularity of the city's first official dog park!

In an effort to help meet the demands for locations to enjoy recreational time with our dogs, the Metro Board of Parks and Recreation has been working to identify ways to meet the needs of a growing population that considers their dogs as part of their family.

But along with enjoying our dogs in both public and private spaces comes the responsibility of cleaning up after our pets. Nationwide the problem of land and water pollution caused by dog waste is growing. So together with the Nashville Humane Association, the Tennessee Veterinarian Medical Association, Metro Public Health Department/Metro Animal Services and Metro Water Services, Metro Parks and Recreation is making a public appeal to dog owners to please clean up after their dogs.

We are launching a ***"Bag It!"*** Public Service Campaign. The campaign encourages dog owners to help us keep our parks clean by using the plastic mutt mitts provided in most parks and picking up after their pets. It's a simple message with a big impact – keeping the environment clean and healthy for *everyone*.

We hope you will participate in our efforts to **Keep Our Parks Clean**.

Demolition Guidelines Handed Out with Demolition Permit

Building Demolition Reference Guide

The following reference material is to be used when demolishing buildings or structures as a guide to facilitate compliance under the current Davidson County, **Metro Water Services (MWS) environmental regulations**. However, in order to insure compliance within Metro Nashville/Davidson County, persons conducting demolition activities must be aware of ***all*** pertinent Metro, State, and Federal regulations and not simply those contained within this document.

During every demolition project, numerous pollutants are liberated, both from the materials used to construct the building and from materials that may have been used or stored inside the building itself. These pollutants may include airborne materials such as asbestos, or water-soluble materials such as heavy metals, toxic organic compounds, and solids (dust). During a rain event, these pollutants dissolve or suspend in the stormwater and are transferred into Metro's Municipal Separate Storm Sewer System (MS4). This MS4 includes all storm drains, roads, ditches, culverts, and parking lots that are designed to route **clean stormwater only** safely into the streams of Metro Nashville/Davidson County.

The NPDES division of MWS has the specific task of monitoring all discharges into this MS4 for the purpose of maintaining the water quality of the streams within Davidson County. If not addressed properly on site, the pollutants produced by demolition activities will enter the MS4 and be routed to a nearby stream. **These pollutants will then damage this stream and the aquatic life within it**. Nearly all pollutant discharges into the MS4 and streams (including pollutants liberated and discharged during demolitions) are deemed "Illicit Discharges" and are illegal in Davidson County under Metro Code of Laws (Metro Code) §§ 15.64.205. If you have questions, contact the MWS NPDES office at (615) 880-2420.

Fortunately, the same Best Management Practices (BMPs) applied on general grading sites (such as those used to control sediment and dust) also work effectively in keeping demolition pollutants on site. Silt fence, storm drain covers, and storm drain insert filters are just a few of the BMPs that can be utilized to control these pollutants on site and prevent them from migrating into the MS4 or nearby streams.

It is also important to note **that demolition projects not exempted by section 3.4 of the MWS Stormwater Management Manual require a MWS grading permit** before the demolition work may take place. For additional information on who or what projects need a grading permit, go to www.nashville.gov/stormwater/grading_permits.doc.

Also, be sure to recycle or dispose of demolition debris properly. For additional information on Nashville's Construction and Demolition Material Recycling Program, go to www.nashville.gov/recycle/Publications/Construction_Recycling_Directory.pdf.

Thank you very much for recognizing the importance of our streams as a valuable natural resource and your help in the protection and improvement of the streams within Metro Nashville/Davidson County.

This publication is a public service of:
Metro Water Services
NPDES Program
Storm Water Quality Control Team
1607 County Hospital Road
Nashville, TN 37218
Phone (615) 880-2420
www.nashville.gov/stormwater

Metro Water Services is in the process of complying with all appropriate Americans with Disabilities Act Guidelines. For additional information contact Joseph A. Estes, Sr., 1600 2nd Avenue North, Nashville, TN 37208-2206; telephone 615-862-4862.

Floodplain Mailing Page 1

FLOOD INFORMATION

FLOOD HAZARD AREAS

The individualized map, presented on the previous page, shows the limits of the 100-year floodplain in your area. The 100-year floodplain is the area that will be flooded on the average of once every 100 years. It has a 1% chance of occurring in any given year. In other words, you have about a 30% chance of experiencing a 100-year flood during the life of a 30-year mortgage. Less severe floods have a greater chance of occurring in any year, but can still create a significant hazard to people and property.

Flood insurance rate maps provide more detailed information on the 100-year floodplain and are available at the Codes Administration Office. For assistance and information, please call 862-6038.

FLOOD WARNING

The National Weather Service will post flash flood warnings or watches when the conditions are present. Know the terms used to describe flooding: Flood Watch = flooding is possible; Flood Warning = flooding is occurring or will occur soon. Keep alert to rising waters in the streams in your area.

NOAA weather radios offer the best method of warning. They can be programmed to sound an alert tone whenever severe weather is approaching your area. This eliminates the need to listen to the radio, and the tones can wake you up if you are sleeping. The cost is minimal and the radios can be purchased at any store selling electronic equipment.

During periods of rain, tune to local television and radio stations, for example:

WKRN – TV channel 2
WSMV – TV channel 4
WTVF – TV channel 5
WZTV – TV channel 17
WSM – Radio station AM 650

FLOOD INSURANCE

Floods cause more damage in the United States than any other natural hazard. Each year, floods cause $4 billion dollars in damage and kill 150 people. Many people do not realize that flood damage is **NOT** covered by standard homeowners insurance policies.

Since 1968, the National Flood Insurance Program (NFIP) has provided federally backed flood insurance to communities participating in the NFIP. Metropolitan Nashville and Davidson County joined the program in 1982, therefore, **insurance is available** for all properties in Davidson County. Flood insurance can be purchased through any licensed property insurance agent or broker. All agents must charge the same rates. Your rates will not change if you file a damage claim; the rates are set on a national basis. The purchase of flood insurance is mandatory as a condition of receiving any federally related financial assistance such as loans through the Federal Housing Administration, the Veterans Administration, or the Small Business Administration for properties in the floodplain.

It has been estimated that only one out of four properties susceptible to flooding is insured. Therefore, a large number of homes and businesses in Davidson County are not protected from the financially devastating effects of a flood. Just because your property has not flooded in the past does not mean that it will not flood in the future.

Don't wait for the next flood to buy insurance protection. Because you are in the 100-year floodplain, we encourage you to obtain flood insurance coverage for both your structure and its contents. There is a thirty (30) day waiting period before National Flood Insurance coverage takes effect. Contact your insurance agent for more information on rates and coverage.

FLOOD SAFETY

The following common sense guidelines can help protect you and your property from the dangers associated with flooding:

- Do not drive through a flooded area. More people drown in their cars than any where else. This happened in 1984 in downtown Nashville. Do not drive around road barriers.

Do not drive through a flooded area.

- Do not walk through flowing water. Currents can be deceptive. Six inches of flowing water can knock you off your feet.
- Stay away from power lines and electrical wires. Electrocution is second to drowning in flood related deaths. Electrical current can travel through water. Report downed power lines to the Nashville Electrical Service at 736-6900.
- If your house is about to be flooded, turn off the power at the fuse box, if you can do so safely.
- Keep children away from the flood waters, ditches, and storm drains. Children have drowned in Davidson County by being swept away by flowing water.
- Monitor the level of floodwaters in the drainage way, especially at night. Be prepared to evacuate. Move your vehicles to high ground before it is too late.
- Do not use electrical appliances that have been wet without first getting them checked by a licensed electrician.
- Be alert to gas leaks. If you smell gas, report it to Nashville Gas at 734-1400. Do not use candles, lanterns, or open flames unless you are certain that the gas has been shut off and your house has been ventilated.
- Do not use gas engines, such as generators, or charcoal fires indoors during power outages. Carbon monoxide exhaust could pose health hazards.
- Clean everything that has been wet. Flood waters will be contaminated with sewage and possibly other chemicals which could pose health hazards.
- Look out for animals, especially snakes. Small animals that may have been flooded out of their homes may seek shelter in yours.
- Look before you step. After a flood, the ground and floors are covered with debris that may include broken glass and nails. Floors and stairs that have been covered with mud can be very slippery.

PROPERTY PROTECTION MEASURES

If your property is susceptible to flooding, there are many flood damage reduction measures that can be used to protect yourself.

- Watertight seals can be applied to brick and block walls to keep out low level flooding.
- Doors and windows can be retrofitted with permanent or manually installed closures.
- Utilities such as heating and air conditioning systems, water heaters, and other major appliances can be elevated to higher floors in the structure or on platforms on lower levels or outside.
- Elevating or relocating the entire structure may also be a feasible option.
- Temporary measures such as moving furniture and other valuables to higher floors or sandbagging exterior openings can also be employed in the event of a flood.

For more information on floodproofing or retrofitting structures visit the reference section of the Main Public Library, located at 615 Church Street, or your local branch library. For assistance and information, please call 862-6038.

FLOODPLAIN DEVELOPMENT PERMIT REQUIREMENTS

All developments in the 100-year floodplain (not just construction of buildings) require local permits.

- A grading permit issued by Metro Water Services is required for all land disturbing activities such as filling or excavating soil, the installation of pipes or digging ditches, and alterations to drainage channels.
- Building permits issued by the Codes Administration are required for all improvements or additions to existing structures as well as for any new structures.

Applications for grading and building permits must be made prior to the start of construction.

Metro's Stormwater Management Regulations require that all residential structures built in the floodplain must be constructed with the lowest finished floor elevation located four feet above the 100-year flood elevation. Commercial structures must be built one foot above the 100-year flood elevation. Additionally, any fill placed in the floodplain must be offset with an equal volume of cut removed from the floodplain.

We encourage you to contact the Stormwater Division of Metro Water Services at 862-4506 to inquire about permit requirements or to report any ongoing activity in the floodplain that may not be permitted. Improper development in the floodplain will make flooding worse and must be controlled.

CUMULATIVE SUBSTANTIAL IMPROVEMENT POLICY

The NFIP requires that if the cost of improvements to a building or the cost to repair damages to a building exceeds 50% of the market value of the building (excluding land value), the building must be brought up to current floodplain management standards, as described in the previous section "Floodplain Development Permit Requirements." Building improvement projects include remodeling, rehabilitation, building additions, and repair and reconstruction projects.

Additionally, the cost of currently planned improvements will be added to the cost of previously made improvements and compared to the existing market value to determine if the improvements exceed 50% of the structure value. For more information on this policy, call 862-4506.

DRAINAGE SYSTEM MAINTENANCE

Natural stream channels are typically large enough to contain only the most frequent flooding events. Larger storms which occur on the average of once every 2 or 5 years will most likely cause the streams to flow out of their banks. For this reason, it is critical that the stream channels be kept clear of trash and debris. Do not dump trash, leaves, branches, Christmas trees, or other yard waste into or adjacent to a stream or drainage ditch. These materials will be washed away during rain events and will most likely be deposited in front of downstream culverts or bridges. Blocked or partially blocked culverts increase the potential for property flooding and may cause water to flow across roadways endangering motorists. Metro has a curbside chipper service for collection of yard waste. Call 880-1000 for the collection schedule in your neighborhood or 862-4600 to report blocked culverts.

Example of landscape waste deposited in front of a driveway culvert.

NATURAL AND BENEFICIAL FUNCTIONS

Floodplains play a valuable role in providing natural and beneficial functions to the Metro area. Floodplains that are relatively undisturbed, or have been restored to a nearly natural state, provide a wide range of benefits to both human and natural systems. These benefits provide aesthetic pleasure as well as function to provide active processes such as filtering nutrients. Several of our floodplain areas are used for recreational purposes such as greenways and parks along the stream (Shelby Bottoms Park, for example). Natural and beneficial functions include:

- Provide flood water storage and conveyance
- Filter nutrients and impurities from runoff
- Provide open space for aesthetic pleasure
- Maintain bio-diversity and the integrity of ecosystem
- Contain historic and archaeological sites that provide opportunities for study
- Provide natural flood and erosion control and reduce flood velocities and peaks
- Create and enhance waterfowl, fish, and other wildlife habitats and provide breeding and feeding grounds.
- Enhance agricultural lands for the harvest of wild and cultivated products

ILLICIT DISCHARGES

Areas that routinely flood or where creeks and streams flow after rain events are very susceptible to the water pollution impacts caused by illegal dumping activities. Trash, Tires, Batteries, Cut Trees/Brush, Yard Clippings/Leaves, Chemicals, Washwater, etc. should **NOT** be dumped into or near storm sewers, catch basins, ditches, or streams. It is a violation of Metro Code §15.64.205 to dump or discharge these materials into either the storm sewer system or streams. Please call the Metro Storm Water Quality Office at (615) 880-2420 to report any such dumping or discharging activities.

Floodplain Mailing Page 2

Dear Resident, 05/10/2004

In 1990, the Metropolitan Government of Nashville and Davidson County joined the Community Rating System which is a program administered by the National Flood Insurance Program (NFIP). Under this program, communities that exceed the minimum requirements of the Federal Emergency Management Agency (FEMA) with respect to floodplain management are rewarded with lower flood insurance rates. Flood insurance policy holders in Davidson County have been receiving a 5% discount on their rates since we entered the program. This represents a combined savings of approximately $50,000 each year.

As part of the NFIP program, floodplains and floodways on many local streams have been established and regulated by FEMA. The most recent Flood Insurance Study (FIS) for Metro Nashville was published by FEMA in 2001. The FIS includes Flood Insurance Rate Maps (FIRM) that present the adopted floodplains, floodways, and flood profiles for streams in Davidson County. This brochure has been delivered to properties located in or adjacent to the 100-year floodplain of Browns Creek. If you have received this brochure, then your property is located in or near the flood hazard area.

All streams within Metro Nashville are subject to flooding and backwater flooding may be significant. Flood-related Presidential Disaster Declarations have been declared for Davidson County as recently as March 1997 and May 2000 for flood damage countywide. During the regional 1997 storm event, six people were killed by tornadoes and subsequent flooding. Additionally, historical flood events of record have repeatedly occurred on the Cumberland River (1927 and 1975), Mill Creek and Sevenmile Creek (1955, 1960, 1962, 1979, 1998), Richland Creek and Sugartree Creeks (1979).

The primary effect of flooding on these streams appears to be inundation, although velocities will become significant to persons and structures under extreme flooding situations. Calculated floodplain velocities range from 1.0 to 5.0 feet per second, which is considered to be of dangerous magnitude. This brochure is intended to educate residents on such topics as flood hazards and flood safety.

If you have any questions concerning this brochure, please call the Stormwater Division of Metro Water Services at 880-2420.

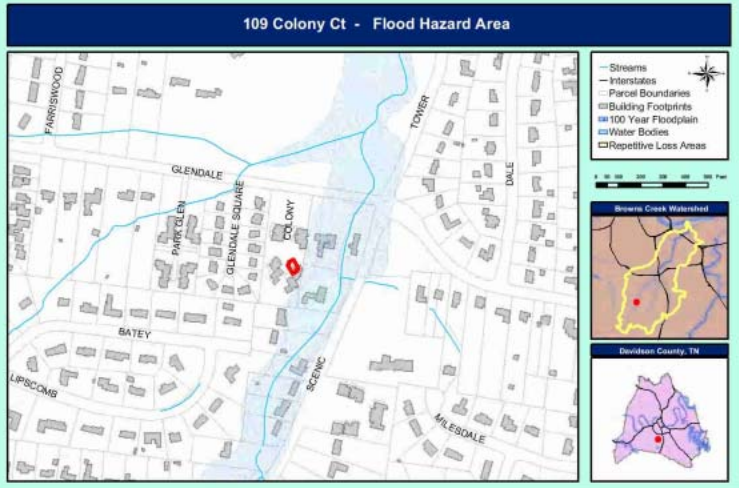
Elevation Certificate Information

Address: 109 Colony Ct
NASHVILLE, TN
37204

Parcel Number: 131080C00300CO
NFIP Community Name: 470040 - Nashville
Map and Panel Number: 47037C0333
Suffix: F
FIRM Panel Date: April 20, 2001

100 Year Flood Elevation (base flood elevation): 559 feet
Top of Bottom Floor (including basement or enclosure) Elevation: 560.6 feet
Lowest Adjacent (finished) Grade Elevation: 561.9 feet

If you have any questions concerning the Elevation Certificate Information, please call 862-6038.



METRO WATER SERVICES
Contact Information

http://www.nashville.gov/stormwater/

METRO WATER SERVICES	862-4600
To inquire whether a property is in the floodplain	862-6038
To report a stormwater / water quality concern	313-PURE (7873)
To report a "new" drainage-related concern	862-4600
To inquire on the status of an "existing" drainage-related concern	880-3390
To inquire about the status of a grading permit application	862-4506

Abandoned Vehicles	862-8590	Curbside Recycling Info	862-8620	AMERICAN RED CROSS	250-4300
Bulk Item Pick-Up	880-1000	Dead Animal Removal	880-1000	METRO PUBLIC WORKS	862-8750
Chipper Service Info	880-1000	Educational Recycling Info	880-1000	NASHVILLE ELECTRIC SERVICE	736-6900
Commercial Recycling Info	862-8620	Grass Cutting (on public right-of-way)	862-8750	NASHVILLE GAS	734-0665
				To report a possible gas leak	734-1400
Information for	862-8750	Hypodermic Needles	340-5644	OFFICE OF EMERGENCY MANAGEMENT	862-8530
Road Repair		Illegal Trash Dumping	340-5644		
Guard Rails		Littering from Vehicles	862-8418		
Alley Maintenance		Recycling Drop-Off Sites	880-1000		
Debris Cleanup		Solid Waste (Hauler / Collector Info)	880-1000 / 862-8740		
Roadway Patching		Used Motor Oil Info	862-8620		
Composting Questions	880-1000				
Convenience Center	880-1000				
Madison Location	860-2508				
Trinity Lane Location	262-2246				

Current Resident
109 Colony Ct
NASHVILLE, TN
37204

Flood Protection Information

RETURN SERVICE REQUESTED

Metro Water Services
NPDES Section
1607 County Hospital Road
Nashville, TN 37218

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 1)

METROPOLITAN BOARD OF PARKS AND RECREATION

DOG MANAGEMENT ON PARK PROPERTY
POSITION PAPER

amended
September 6, 2005

Mission Statement

"It is the mission of the Metropolitan Board of Parks and Recreation to provide every citizen of Nashville and Davidson County with an equal opportunity for safe recreational and cultural activities within a network of parks and greenways that preserves and protects the region's natural resources."

Introduction

Increasingly across the nation dog parks are recognized as one of the many amenities that helps improve a community. A dog park is not just about dogs, it's about people and helping them to build positive, cohesive relationships in their neighborhoods. In short, dog parks are one of the many benefits of successful, innovative cities across the nation. Current national trends have revealed an interest and demand for recreational opportunities for dog owners and their pets on municipal park property. A recent Gallup poll stated that 42% of households in the United States have dogs and according to the National Recreation and Parks Association there are an estimated 2,000 existing dog parks in the United States. The Metropolitan Board of Parks and Recreation has established goals and adopted recommendations to accommodate this popular interest within the framework of the Board's Mission Statement.

The position of the Metropolitan Board of Parks and Recreation is that all Metro Parks will be "dog friendly" subject to Park Board rules, regulations, and policies. It is the responsibility of dog owners and custodians of dogs to ensure that they are in compliance with these conditions when they visit and enjoy Metro Parks and Greenways with their pets.

The use of Metro Park property and facilities by dog owners, custodians of dogs, and their pets will be subject to the Department's "core service" conditions that promote safety and quality of recreational experiences for all residents who share the park resources.

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 2)

To promote responsible pet ownership practices, compliance with policies, and quality recreational experiences, the Director has established a Dog Management Team with representatives from the planning, public information, natural resource management, and law enforcement sections. The Dog Management Team has formed a partnership with representatives from the Nashville Humane Association, the Tennessee Veterinarian Medical Association, Metro Public Health Department / Metro Animal Services, and Metro Water Services.

Primary goals of dog management on park property are:

- **strict compliance with the leash law**
- **increase removal of dog waste**
- **increase the number of off leash areas**

Opposing views, counter claims, and consequences

This position paper recognizes the existence of opposing views and counter claims. For example some residents may believe that their unrestrained dogs pose no threat or nuisance to other park visitors throughout the Metro Park system. However, Park Police and other staff report that unrestrained dogs have become one of the most frequent sources of complaints on park property. The seriousness of these complaints range from dog bites to humans, dog fights that include injuries and veterinarian bills, altercations between park visitors, and negative impacts to the quality of recreational experiences for runners, walkers, bicyclers, and others. Leash free dog experiences should be allowed only in designated, properly designed park areas.

Some residents believe that responsibility for cleaning up after their dogs on park property is an unnecessary and intrusive expectation. However, clean up obviously helps keep park areas more enjoyable and hygienic, while failure to do so passes maintenance responsibility on the others and leaves a mess that park visitors may step in. Furthermore, the Metro Public Health Department and Metro Water Services report that uncollected dog waste, especially in concentrated areas, is a risk to public health, safety, and water quality. The Metropolitan Code of Laws (8.04.180) states that: "A dog owner shall clean up and remove any excrement left by his/her dog(s) on any public or private property. . ."

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 3)

Some residents propose that unleashed dog areas be designated in their neighborhood parks prior to the establishment of regionally distributed facilities in the Metro Park system. However, review of this practice reveals the potential for the unintended consequence of neighborhood parks being overwhelmed by dog owners and their pets from a wider population than is appropriate for this classification of municipal parks.

In order to accommodate the interest and demand for recreational opportunities for dog owners and their pets in a successful, safe, and comprehensive manner, the following recommendations will be implemented.

Recommendations:

1) **Conduct an ongoing educational campaign and marketing initiative with the following goals:**

- **Strict compliance with the leash law and promotion of dog owner/custodian control of their pets**
- **Increased collection and removal of dog waste**

The educational campaign will include a kick-off event, print media, electronic media, and digital/website information. The motivators for the campaign will include public safety, public health, a cleaner environment, quality of recreational experiences, and enforcement. It is the position of the Metro Board of Parks and Recreation that education, increased awareness, and voluntary compliance are the most effective and desirable methods of achieving these goals.

2) **Implement and further develop the recommendations of the 2002 *Parks & Greenways Master Plan***

The Parks & Greenways Master Plan recommended the development of two pilot dog parks in Davidson County – the Shelby Dog Park, which opened in June 2004 and the Warner Dog Park, which opened in June 2005.

Based on the proven popularity and success of these new facilities, Metro Parks is committed to providing additional leash-free sites throughout Davidson County per the following development guidelines. These guidelines have been developed based on our experience with the Shelby and Warner projects, advice from Dog Management Team and Partners, and research into off-leash facilities nationwide.

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 4)

a. Develop a system of leash-free facilities throughout the county that offers a range of experiences.

Metro Parks' off-leash system should provide a variety of experiences that respond to a range of needs. A conventional, fenced dog park, as at Shelby, will be the backbone of our system but, additionally, sites should be developed that offer separate areas for small dogs, hiking opportunities in large natural areas, access to a waterbody, and other well-documented needs.

b. Develop regional facilities first

- Providing a leash-free area in each of the major quadrants of the city ensures that all citizens of the county have equal access to this type of recreation.

- Regional parks are usually better-suited than neighborhood parks to incorporating leash-free areas

    * It's easier to find "under-utilized" space
    * Conflicting uses are easier to keep geographically separated
    * Existing parking may be adequate, and can often be shared with other park uses
    * Surrounding roads are more likely to be classified as Collectors or Arterials, and have the capacity to handle the additional traffic

- Experience indicates that a neighborhood park is usually a poor candidate for a dog park.

  Developing a neighborhood dog park without first having a regional system would attract users from throughout the county, placing too much stress on the park, parking lots, local streets, and surrounding residences.

  Generally, only a fenced, exclusive-use dog park is appropriate in a neighborhood park, since other uses and public streets (traffic) are close-by. But due to the intensive, multiple, and shared uses in a neighborhood park, it is generally better for Metro Parks to maximize shared uses and minimize exclusive uses.

  It may be appropriate to consider the development of neighborhood dog parks after a regional leash-free system is in place. At such time, a neighborhood dog park would primarily attract neighborhood residents.

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 5)

c. Develop leash-free areas in phases

- As a new type of park facility/use; leash-free areas should be developed as need, funding, and opportunity indicates.
- As the highest priority leash-free areas come on-line, use should be monitored to determine if countywide needs have been met in terms of geographic distribution and variety of experience, and if additional leash-free areas are needed.
- A leash-free area is going to be more successful if there is an existing base of known users to promote responsible use of, and to build community around, each facility.
- Where the opportunity presents itself, it may be appropriate to consider incorporating leash-free areas into large park development projects at a minimal cost.

d. Leash-free facility locations

Implementation of the following recommendations would result in a regional leash-free system that offers a variety of experiences.

- **Shelby Park** (Downtown/East) Opened June 2004
- **Warner Park** (Southwestern Nashville) Opened June 2005
- **Centennial Park** (Midtown)
  Expected opening by the end of 2005.
  Sites on and around First Amendment Hill are being evaluated for feasibility.
- **"Twelve South Park"** (Midtown/West)
  This is an undeveloped property east of Granny White Pike, South of Gale Lane, and owned by TDOT. Presently, Metro is negotiating with TDOT to be given control of the property

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 6)

- **"Twelve South Park"** (Midtown/West)
  There is intense demand for a dog park in this high-density area of the city. Sevier Park has long been a defacto dog park, with some resulting conflicts. As outlined in the general discussion of neighborhood parks, Sevier Park is poorly suited to the development of a formal dog park. "Twelve South Park" is within a block of Sevier Park and is much better suited to dog park development.

  It is "new" parkland, with few existing user groups competing for space.

  It would reduce dog traffic in Sevier Park and accompanying conflicts, although the park should continue to welcome leashed dogs per general park regulations.

  The *Parks & Greenways Master Plan* recommends that additional neighborhood/community park acreage be acquired in Subarea 10.

  Planning should occur in coordination with surrounding neighborhood groups.

- **Bell's Bend Natural Area** (Western Davidson County)
  800-acre natural area with extensive trail system to be developed in phases. Construction should be completed by the end of 2005.

- **Stones River Greenway Percy Priest Dam Trailhead OR Two Rivers Lake** (Hermitage, Donelson)
  Both sites are being evaluated to serve this area. The open area at the foot of the Percy Priest Dam is currently being developed as a large-scale trailhead for the Stones River Greenway. The open acreage is suitable for a dog park, the use is compatible with the greenway, and no additional parking would be required.

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 7)

- **Stones River Greenway Percy Priest Dam Trailhead OR Two Rivers Lake** (Hermitage, Donelson)
  Furthermore, a dog park would offer an additional destination that would enhance the greenway. The property is owned by the US Army Corps of Engineers and the use would require their approval.

  Two Rivers Lake provides irrigation water for the golf course. This site would offer a water experience for dogs and would activate an otherwise underutilized area of the park. It is also accessible from the Stones River Greenway.

e. Planning & design considerations

- Generally accepted national standards should be the basis for the planning and design of all leash-free areas, applied and adapted as necessary to address site-specific opportunities, constraints and objectives. Outlined below are fundamental issues to take into consideration.

- Within Metro's system of leash-free areas, the following opportunities should exist:

  Hiking opportunities (Warner Parks, Bells Bend)

  Access to a water body (Bells Bend, Two Rivers Lake)

  Separate fenced areas for small and large dogs

- Characteristics of a conventional dog park:

  It is fenced

  It is an exclusive use

  It may not be appropriate where there are nearby streets or conflicting park uses

  It can accommodate dogs not under voice control and effectively contains all dogs

  When separate areas for small and large dogs are provided, there should be no common fences

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 8)

- Characteristics of a leash-free area, such as a hiking trail loop:

  It can be multi-use -- shared with compatible, non-dog related users as long as they are made aware that they will be encountering unleashed dogs

  It requires a large acreage

  It is often unfenced, so dogs must be under voice control

- Characteristics of a leash-free area, such as a hiking trail loop:

  If unfenced, it must be located away from public roads or other active park uses

  Because it is multi-use, development costs may be minimized and wrapped into a larger project

- A specific site may lend itself to a facility that incorporates some of the functions or design elements of both a fenced dog park and an open, leash-free area.

- No regional facility should be less than two acres in size.

- All leash-free areas should incorporate the following features:

  Dog waste bag dispensers

  Trash receptacles

  Regulatory signage

  Shade opportunities

  Fresh drinking water

  Benches

  Incorporating other features such as play equipment, should be evaluated by the Dog Management Team members and advisors.

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 9)

3) Continue to develop and install signage in appropriate locations to educate park visitors about compliance with the leash law and responsible pet ownership on park property.

4) Continue to increase the number of dog waste bag dispensers in appropriate locations throughout the Metro Park system, and require dog owners/custodians of dogs to clean up after their pets on park property.

   Metro Water Services has estimated that 31,000,000 pounds of dog waste are generated in Davidson County each year. Dog feces may carry parasites, bacteria, germs, pathogens, and viruses that are harmful to humans. Uncollected dog waste left on the ground can find it's way into creeks and streams and ultimately into the Cumberland River, negatively impacting water quality. Clean up after your dog also keeps park areas attractive and hygienic, while failure to do so leaves a mess for someone else to step in or deal with. To assist with this important responsibility, Parks Maintenance Staff have installed approximately 50 dog waste bag dispensers in multiple locations throughout the park system.

   It is the position of the Metro Board of Parks and Recreation that dog owners / custodians of dogs will be required by Park Board policy to pick up after their pets on park property. Furthermore, in the interest of public health and a cleaner environment, it is recommended and encouraged that dog waste be picked up on all public and private property.

5) Continue to review, determine, and list park areas and facilities where dogs should be prohibited for public health, safety, and other appropriate reasons.

   Two obvious examples where dogs will be prohibited include playgrounds and pool facilities, where barefoot children and others are especially vulnerable to exposure to harmful parasites, bacteria, germs, pathogens, and viruses commonly found in dog waste.

6) Continue to enforce Park Board rules, regulations, and policies related to dog management, compliance with the leash law, and responsible pet ownership on Metro Park property.

   Education, increased awareness, and voluntary compliance are the most effective and desirable methods for achieving success. Enforcement is a tool that will be used when necessary and appropriate.

Metro Parks Dog Management Paper Amended in Permit Year 3 (Page 10)

7) Proposals from residents, neighborhood organizations, and others

Proposals from residents, neighborhood organizations, and others about additional dog parks and leash-free areas should be submitted to the Park Board for consideration.

Conclusion

The Metropolitan Board of Parks and Recreation recognizes the need and importance of strict compliance with the leash law, increased removal of dog waste, and increased recreational opportunities for dog owners and their pets in the Metro Park system.

To successfully accommodate this demand within the framework of the Mission Statement, in a safe and comprehensive manner, with the avoidance of unintended consequences, the Park Board adopts the recommendations of this position paper and instructs staff to proceed with implementation.

Metro Waste Management Division Mailing (Page 1)

GET READY, NASHVILLE!

A new trash collection program is coming soon to clean up Nashville's neighborhoods.

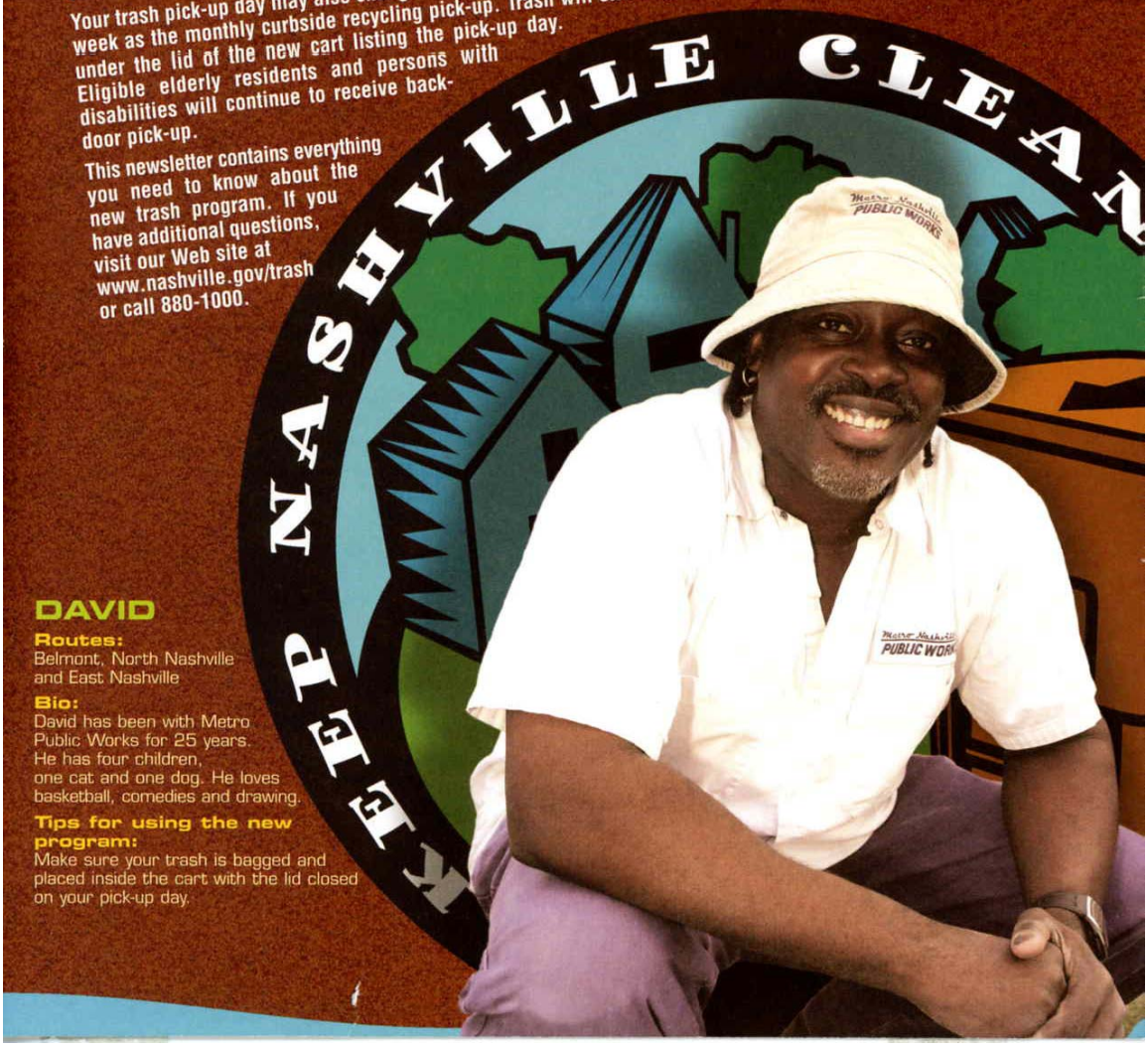
Within the next few weeks, Metro Public Works will deliver your new 96-gallon, brown, rolling trash cart. Your new trash cart is part of an automated program to increase the cleanliness and efficiency of trash collection in your neighborhood. Keeping Nashville clean is everyone's responsibility. With your help, we can make Nashville a cleaner place to live, work and play.

Carts will be distributed approximately one week before your first collection. All carts will be delivered by summer, and residents may request a second cart once all carts have been delivered.

Your trash pick-up day may also change with the new program. Trash collection will occur on the same day of the week as the monthly curbside recycling pick-up. Trash will still be picked up weekly, and there will be a sticker under the lid of the new cart listing the pick-up day.

Eligible elderly residents and persons with disabilities will continue to receive back-door pick-up.

This newsletter contains everything you need to know about the new trash program. If you have additional questions, visit our Web site at www.nashville.gov/trash or call 880-1000.



DAVID

Routes:
Belmont, North Nashville and East Nashville

Bio:
David has been with Metro Public Works for 25 years. He has four children, one cat and one dog. He loves basketball, comedies and drawing.

Tips for using the new program:
Make sure your trash is bagged and placed inside the cart with the lid closed on your pick-up day.

Metro Waste Management Division Mailing (Page 2)

NEW PROGRAM INFO

Automated Trash Pick-up Next Step in City's Waste Management Plan

The automated trash pick-up program is the next step in the waste management plan adopted by Metro Council in 2002.

The Curby curbside recycling program and the closing and demolition of the thermal plant were two important parts of the plan which have already been implemented. The new trash program will mean significant savings for taxpayers.

With the new trash program, all homes will have uniform-looking carts, and trash bags will no longer be scattered throughout neighborhoods. The new rolling trash carts will also help keep rodents from getting into trash.

Trash collectors will also benefit from the program because their employees will face fewer injuries on the job. Mechanical arms on the trucks will empty the trash carts. The automated program will make trash day faster and more efficient for everyone.

Help your trash professionals and do your part to help our city achieve the goal of making Nashville a cleaner place to live.

RULES OF USE

- Look under your cart lid for your pick-up day.
- When your trash cart is delivered, it will be placed where it should be positioned on pick-up day.
- On your pick-up day, place your cart where it was delivered with the arrow on the lid pointing toward the street or alley. Your trash will be picked up between the hours of 7 a.m. and 5 p.m.
- Do not place the cart within 3 feet of any stationary object such as a car, mailbox, utility pole, Curby cart, etc.
- Do not place the cart under wires, tree limbs, building overhangs or other items that could be damaged. Please make sure there is 15 feet of clearance.
- Items that are placed outside the trash cart will not be picked up.
- Please remove your cart from the street by 7 p.m. on pick-up day.

You've got questions? N

When will I get my new cart?

Your new cart will be delivered within a few weeks of receiving this newsletter. The transition for all residents should be complete by summer. Carts will be delivered about one week before the first trash collection.

How should I use my new trash cart?

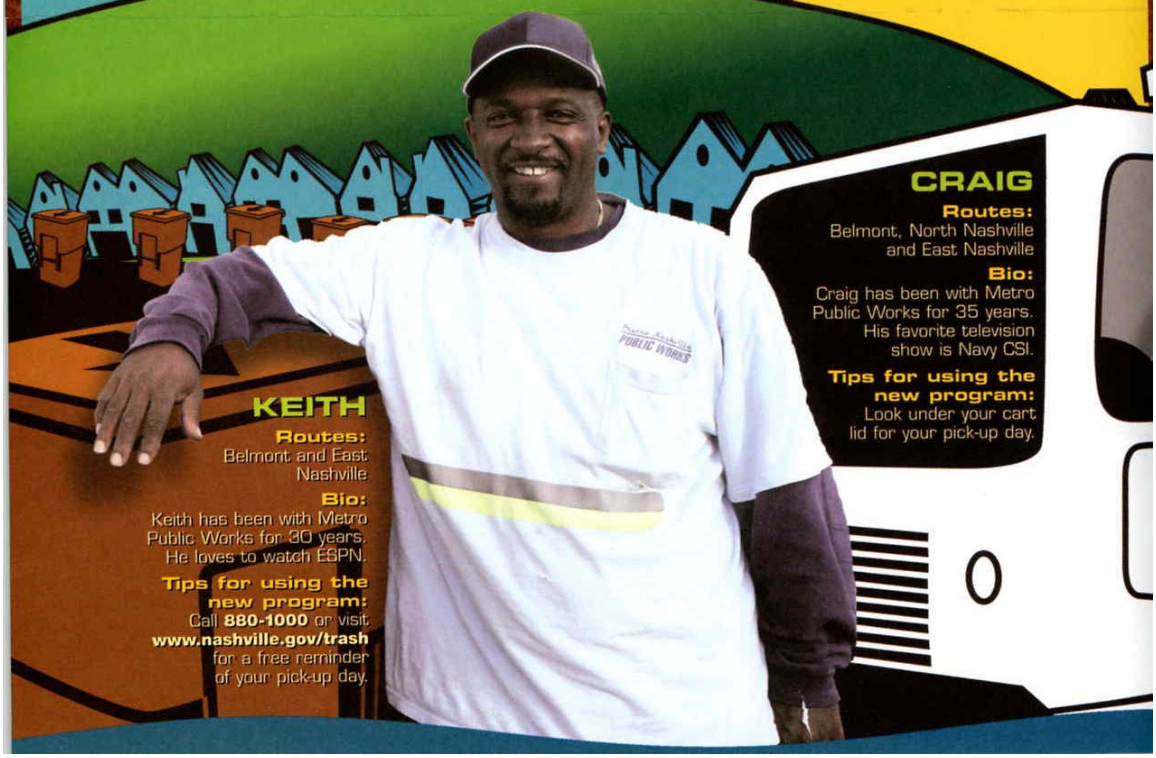
Place your bagged trash inside your cart and on your pick-up day, place the cart at the curb or in the alley, 3 feet from any stationary object. Make sure to place the cart so the arrow on the lid opening faces the street or alley.

Will my trash pick-up day change?

Trash pick-up days will change for some residents. Your weekly trash pick-up day will be the same day as your monthly curbside recycling pick-up day.

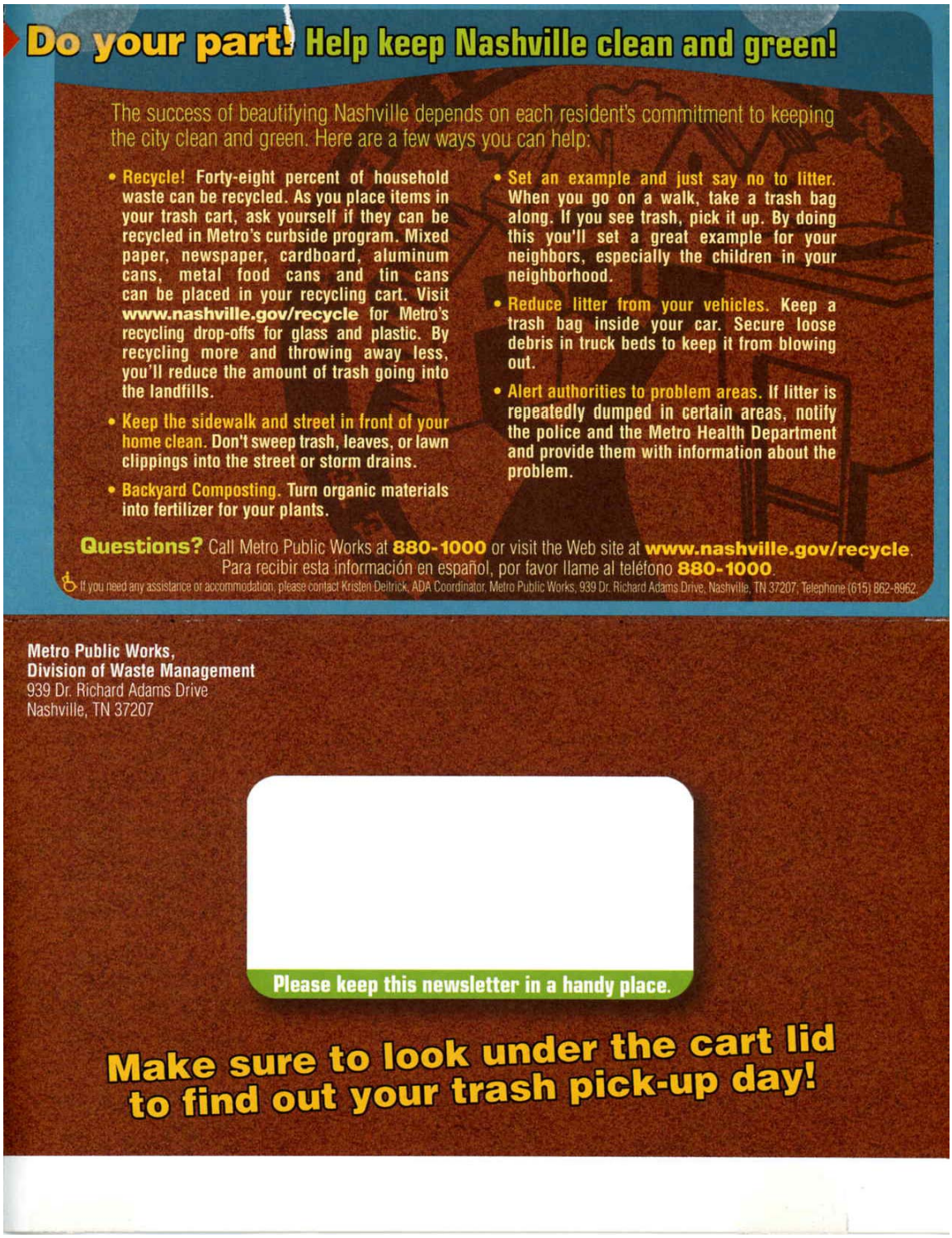
How will I know when my pick-up day is?

When Metro delivers your new trash cart, look for the sticker under the cart lid to find out your pick-up day and a number to call if you have questions or need help.



Metro Waste Management Division Mailing (Page 3)

Metro Waste Management Division Mailing (Page 4)



Do your part! Help keep Nashville clean and green!

The success of beautifying Nashville depends on each resident's commitment to keeping the city clean and green. Here are a few ways you can help:

- **Recycle!** Forty-eight percent of household waste can be recycled. As you place items in your trash cart, ask yourself if they can be recycled in Metro's curbside program. Mixed paper, newspaper, cardboard, aluminum cans, metal food cans and tin cans can be placed in your recycling cart. Visit **www.nashville.gov/recycle** for Metro's recycling drop-offs for glass and plastic. By recycling more and throwing away less, you'll reduce the amount of trash going into the landfills.
- **Keep the sidewalk and street in front of your home clean.** Don't sweep trash, leaves, or lawn clippings into the street or storm drains.
- **Backyard Composting.** Turn organic materials into fertilizer for your plants.
- **Set an example and just say no to litter.** When you go on a walk, take a trash bag along. If you see trash, pick it up. By doing this you'll set a great example for your neighbors, especially the children in your neighborhood.
- **Reduce litter from your vehicles.** Keep a trash bag inside your car. Secure loose debris in truck beds to keep it from blowing out.
- **Alert authorities to problem areas.** If litter is repeatedly dumped in certain areas, notify the police and the Metro Health Department and provide them with information about the problem.

Questions? Call Metro Public Works at **880-1000** or visit the Web site at **www.nashville.gov/recycle**.
Para recibir esta información en español, por favor llame al teléfono **880-1000**.

If you need any assistance or accommodation, please contact Kristen Deitrick, ADA Coordinator, Metro Public Works, 939 Dr. Richard Adams Drive, Nashville, TN 37207; Telephone (615) 862-8962.

Metro Public Works,
Division of Waste Management
939 Dr. Richard Adams Drive
Nashville, TN 37207

Please keep this newsletter in a handy place.

Make sure to look under the cart lid to find out your trash pick-up day!

Fats, Oils, and Grease Program Handout (Page 1)

Sewer Cleanouts: Regularly check all sewer cleanouts on your facility's property to make sure the covers are solid and secure. Replace damaged or missing cleanout covers immediately to prevent rainwater inflow and problems.

Damaged cleanout cover

Missing cleanout cover

STORMWATER...
MINIMIZE YOUR RESTAURANT'S
STORMWATER IMPACTS

1. **Maintain clean area around the grease recycle bin.** Make employees aware to be careful not to spill any fats, oils and grease. If there is a spill, clean it immediately.

Stormwater impact from recycle bin spill

2. **Do NOT pour oils or grease down storm grates, storm drains, sewer drains or on the ground.**

Grease evidence at storm gate. Grease was discharged into stream Enforcement action was taken.

3. **Clean vent hoods regularly** to prevent fats, oils and grease discharge to the roof of your facility or on ground near your facility.
4. Design and locate dumpsters and outdoor wash areas to minimize stormwater impacts.

Restaurants & Food Service Establishments need to make sure they:

1. Have proper grease control equipment **installed**.
2. **Maintain** (routinely clean or pump out) grease control equipment. Check interceptor regularly to make sure it has outlet Ts, and the structure is in good operating condition.
3. **Keep records on-site** of grease control equipment pumping/cleaning and maintenance to provide to Metro inspectors.
4. **Implement Best Management Practices.**

BEST MANAGEMENT PRACTICES (BMPs)

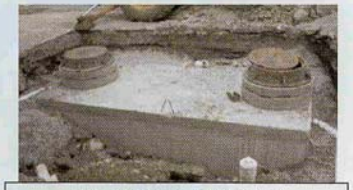
- Recycle waste cooking oil. Do NOT pour down sinks or any drains. Do NOT pour into any storm grate or on ground.
- "Dry wipe" all pots, pans, & plates prior to dishwashing. Dry wiping and scraping pots, pans, & plates' food particles and grease residue into the trash helps prevent grease buildup in your sewer lines and Metro's sewer lines.
- Use strainers in sink drains to catch food scraps and other solids, and empty strainer contents into trash.
- Post "NO GREASE" signs above sinks.
- Food grinders are allowed but the use is discouraged since these will contribute to grease discharge and decrease efficiency of interceptors and traps.
- Educate and train kitchen staff that grease control is important and inform them how they can work to provide a positive impact on the environment and your plumbing system.

Metro Department of Water & Sewerage Services

GREASE CONTROL EQUIPMENT

Policy for

New Food Service Establishments
and
Upgrade to Existing Food Service Establishments



Grease Interceptor Installation

As per Metro Code of Laws all food service establishments need to control fats, oils and grease discharges from their facility. This brochure is provided as guidance for new restaurants and existing facilities that are upgrading, or have change of ownership.

Fats, Oils, and Grease Program Handout (Page 2)

Why is Grease Control Equipment Installation Required?

Fats, oils and grease can cause serious problems in the sewer system and in a restaurant or food service establishment. Problems include raw sewage overflows due to blocked sewer lines, rancid odors, potential contact with microorganisms that can cause hepatitis and gastroenteritis, expensive cleanup, repair and replacement of damaged property. Sewer line blockages due to fats, oils and grease from food service establishments have increased cost to the Metro Department of Water & Sewerage Services and increased reporting of sanitary sewer overflows to the Tennessee Department of Environment & Conservation and the EPA.

What is a food service establishment?

Any facility or business engaged in preparing, serving or making food available for consumption.

There are 5 classifications for food service establishments with **minimum** grease control equipment requirements.

Class 1: Deli, mobile food vendors, defined by NAICS* 72213 & 722330 (minimum 20 gallon per minute/40 pound capacity grease trap)

Class 2: Limited Service Restaurants/Caterers, defined by NAICS 722211 & 722320 (minimum 500 gallon grease interceptor)

Class 3: Full Service Restaurants, defined by NAICS 722110 (minimum 1000 gallon grease interceptor)

Class 4: Buffet and Cafeteria Facilities, defined by NAICS 72212 (minimum 1500 gallon grease interceptor)

Class 5: Institutions-schools, hospitals, prisons, defined by NAICS 722310 (minimum 2000 gallon grease interceptor)

***NAICS:** North American Industry Classification System

1. What must a new food service establishment, or upgrade to existing food service establishment, or change in ownership of an existing food service establishment do?

Submit a Fats, Oils & Grease (FOG) Control Plan to:

Metro Water Services
Environmental Compliance
FOG Control Plan
1607 County Hospital Road
Nashville, TN 37218

2. What needs to be included in the FOG Control Plan?

- Identification and number of all cooking and food preparation equipment (i.e. fryers, grills, woks, etc...)
- The number and size of dishwashers, sinks, floor drains, mop sinks and other plumbing fixtures
- Type of Food Service Establishment classification (see inside left of brochure)
- Type of food to be served
- Plans for the grease interceptor, including dimensions and location

3. What does Metro Water Services do when the FOG Control Plan is received?

Metro Water Services will review the FOG Control Plan, grease interceptor sizing and approve, or make changes as necessary to aid in the protection of a FOG discharge from the food service establishment. Remember, the 3 compartment sink is NOT the only source of grease.

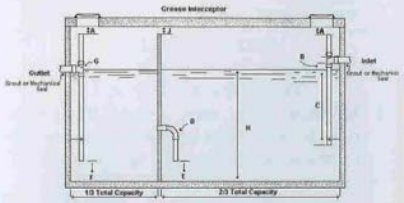
Grease Control Equipment Specifications

Grease Control Equipment must remove fats, oils & grease at or below the Metro Code of Laws Title 15.60.70 limit of 100 mg/L. Failure to comply, will require enforcement action in accordance with the Enforcement Response Plan as required in Metro Code of Laws Title 15.60.390.

GREASE CONTROL EQUIPMENT

GREASE INTERCEPTOR..

Is an underground tank with usual capacities ranging from 500 gallons to 2000 gallons. Interceptors need to be cleaned (pumped out) of complete contents at a recommended minimum frequency of every 90 days. Some facilities will need to pump interceptors more frequently (i.e. monthly). Class 2 through Class 5 food service establishments need to have grease interceptors installed.



A.) Minimum 6", but not less than pipe diameter.
B.) Inlet pipe invert to be 2 1/2" above liquid surface.
C.) Inlet pipe to terminate 2/3 depth of water level.
D.) 90 degree Sweep, minimum size- 6".
E.) 12" from floor to end of sweep.
F.) 12" from floor to end of outlet pipe
G.) Outlet pipe no smaller than inlet pipe, minimum- 4".
H.) Minimum depth of liquid capacity- 42".
I.) Maximum distance from ceiling- 6"

GREASE TRAP...

Is an indoor, "under the sink" unit with minimum size requirement of 20 gallon per minute / 40 pound capacity trap. Traps are for Class 1 facilities only. Traps must have flow restrictor installed and be vented. Traps should be cleaned regularly (every 2 weeks) to prevent grease discharge from the food service establishment.

Grease Interceptor Maintenance Guide (Spanish Version, Page 1)

Transportadores permitieron acarrear la basura del interceptor de la grasa
(listó alfabéticamente):

A-1 Septic Pumping	615-444-0833
Atlas Septic Service	615-794-0960
GreaseMaster	615-865-4445
Kennedy Septic Service	931-645-6577
Music City Grease Service	615-399-8400
Nashville Recycling	615-244-5423
Residue Rescue	615-883-2544
Richards Septic Service	615-262-0667
Roberts Plumbing Service	615-822-3596
Septic Maintenance, Inc.	615-776-2090
Sidewinder	615-851-1517

Someta 'Grease Interceptor' Forma de certificación anualmente (según su FOG Permit requiere):
Metro Water Services
FOG Control Program
1607 County Hospital Road
Nashville, TN 37218

*Contact su transportador o fontanero de la basura de la grasa para terminar el Grease Interceptor Certification Form. Una copia de la forma de la certificación se puede encontrar en el Web site de Metro Water Services (Section II. Grease Management):
www.nashville.gov/water/environmental_compliance.htm

Las mejores prácticas de gerencia (BMPs):
1. Mantenga el interceptor de la grasa , bombeando cada 90 días, llevando registros del bombeo
2. Recicle el aceite del freír. NO vierte en los fregaderos o cualesquiera drenan. NO vierte en cualquier rejilla de la tormenta o en la tierra.
3. "Limpieza seque " y raspe todos los cazuelas, cacerolas, y placas en un envase de la basura para quitar partículas residuales del aceite, de la grasa y del alimento.
4. Utilice las pantallas en drenes del fregadero y suele los drenes, y el contenido periódicamente vacío en el envase de la basura.
5. Fije "no grasa" los signos encima de fregaderos
6. Eduque y entrene todos empleados sobre control de la grasa.
7. Si ocurre un derramamiento del aceite, limpie encima de usar "secan" el material absorbente del aceite o utilizan el hielo. ¡NO en drenes!
8. El uso de la muela del alimento se desalienta.

Metropolitan Government of Nashville & Davidson County
Department of Water and Sewerage Services

Interceptor de la grasa, 'grease interceptor'
Guía del mantenimiento

Interceptor nuevamente instalado de la grasa

El mantenimiento apropiado del interceptor de la grasa es necesario prevenir los desbordamientos y obstrucciones en el sistema de alcantarilla de Metro Nashville. Su gorduras, aceite y grasas (FOG) Permite requiere que el interceptor de la grasa de su facilidad sea mantenido y tenga registros apropiado.

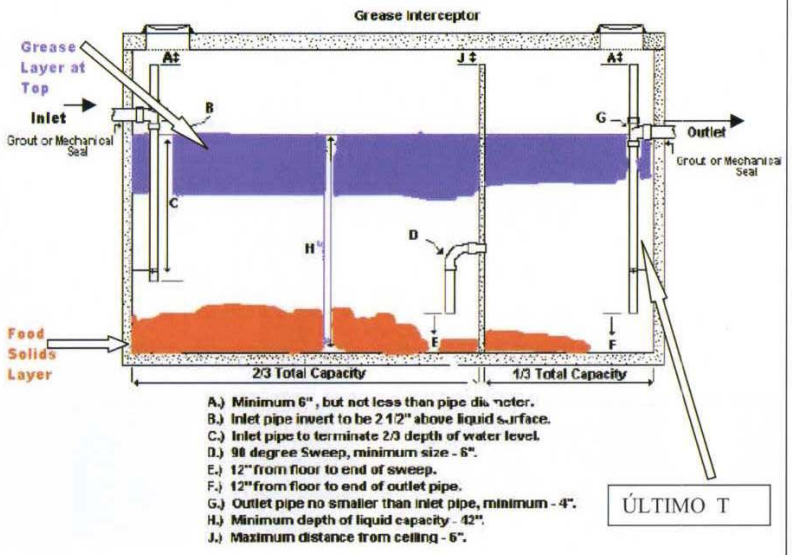
La descarga de las gorduras y aceite y grasas (FOG), de un establecimiento del servicio de alimento, causa obstrucciones en las líneas de la alcantarilla, que dan lugar a desbordamientos de la alcantarilla.

Prevenga los desbordamientos y cuestes de mantenimiento crecientes de la alcantarilla, siguiendo Metro código de leyes.

Para más información vea Metro Agua Servicios, Web site de ambiental acatamiento:
www.nashville.org/water/environmental_compliance.htm
(véase Section II. Grease Management)

Grease Interceptor Maintenance Guide (Spanish Version, Page 2)

La conservación apropiada del 'grease interceptor' es necesaria para prevenir las capacidades excesivas de la alcantarilla!



ÚLTIMO T

Ningún Último T instalado
(permite que FOG sea descargado que causa obstrucciones de la alcantarilla)

Instalación apropiada de Último T
(Numero 40 PVC tuberia, abajo a 12 "del fondo del tanque previene descarga de FOG)

Mantenimiento requerido del interceptor de la grasa:

1. **Limpie o bombee el contenido completo del interceptor en un mínimo de cada 90 días.** Algunas establecimientos necesite limpiar mensual o cada dos meses, para evitar màs que 25% de capacidad del interceptor con los sólidos de la grasa y del alimento Cheque con su transportador de la basura grasa para determinar si su frecuencia necesita ser 30, 60 o 90 días.

2. **Cerciórese de que el contenido completo del interceptor esté bombeado.** No se permite ningún bombeo parcial (capa de la grasa solamente). Contacto su transportador de la basura grasa para cerciorarse de que el contenido completo está bombeado.

3. **Tenga una registra del bombea y limpia del interceptor, en l facilidad para los inspectores**. La registra deben incluir la fecha bombeada, el volumen bombeado y la identificación del transportador de la grasa basura. También, repase su permiso de FOG y guarde el permiso y registra en su facilidad.

4. **Tenga su transportador de la grasa basura terminan un Metro Water Services Grease Interceptor Certification Form cada año y someten (correo) la forma a Metro Water Services.** Corrija cualquier deficiencia en forma de la certificació especialmente el ùltimo que falta T o la deterioración del interceptor.

5. NO descarga de cualesquiera aceites o grasa en los drenes del piso, drenes del fregadero, mop se hunde, las conexiones de la alcantarilla o las rejillas de lluvia. Disponga correctamente de los aceites y la grasa adentro recicla compartimientos o los envases basuras.

6. Repase Best Management Practices (BMPs) en este folleto con todos los empleados, y eduque empleados sobre grasa..

Grease Interceptor Maintenance Guide (English Version, Page 1)

Permitted Grease Interceptor Waste Haulers
(listed alphabetically):

A-1 Septic Pumping	615-444-0833
Atlas Septic Service	615-794-0960
GreaseMaster	615-865-4445
Kennedy Septic Service	931-645-6577
Music City Grease Service	615-399-8400
Nashville Recycling	615-244-5423
Residue Rescue	615-883-2544
Richards Septic Service	615-262-0667
Roberts Plumbing Service	615-822-3596
Septic Maintenance, Inc.	615-776-2090
Sidewinder	615-851-1517

Submit Grease Interceptor Certification Form annually (as per your FOG Permit requires) to:
Metro Water Services
FOG Control Program
1607 County Hospital Road
Nashville, TN 37218

*Contact your grease waste hauler or plumber to complete the Grease Interceptor Certification Form. A copy of the certification form can be found at Metro Water Services website (Section II. Grease Management):
www.nashville.gov/water/environmental_compliance.htm

Best Management Practices (BMPs):
1. Maintain grease interceptor
2. Recycle waste cooking oil. Do NOT pour down sinks or any drains. Do NOT pour into any storm grates or on ground.
3. "Dry wipe" and scrape all pots, pans, and plates into a trash container to remove residual oil, grease and food particles.
4. Use strainers in sink drains and floor drains, and periodically empty contents into trash container.
5. Post "NO GREASE" signs above sinks.
6. Educate & train employees on grease control.
7. If an oil or grease spill occurs, clean up using "dry" oil absorbing material or use ice. Do NOT wash into drains!
8. Food grinder use is discouraged due to build up of solids.

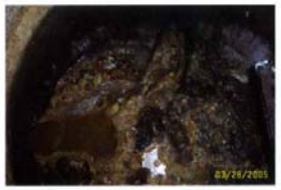
METRO WATER SERVICES

Metropolitan Government of Nashville & Davidson County
Department of Water and Sewerage Services

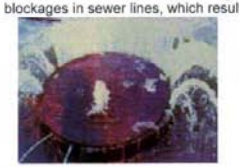
Grease Interceptor Maintenance Guide


Newly installed grease interceptor

Proper grease interceptor maintenance is necessary to prevent sanitary sewer overflows and sewer line blockages in the Metro Nashville sewer system. Your Fats, Oils & Grease (FOG) Permit requires that your facility's grease interceptor be maintained and have proper equipment.



Fats, Oils & Grease (FOG) discharge from a food service establishment causes blockages in sewer lines, which result in sanitary sewer overflows.

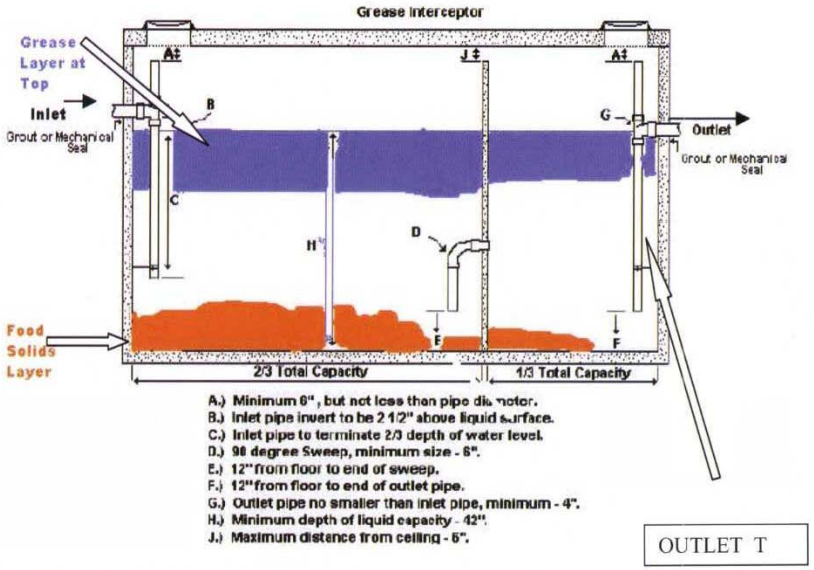


Prevent Sanitary Sewer Overflows & increased sewer maintenance costs, as per Metro Code of Laws.

For more information see Metro Water Services, Environmental Compliance website:
www.nashville.gov/water/environmental_compliance.htm
(see Section II. Grease Management)

Grease Interceptor Maintenance Guide (English Version, Page 2)

Proper Grease Interceptor Maintenance is Necessary to Prevent Sewer Line Interference & Blockage and Sewer Overflows!



OUTLET T

*NOTE: If the outlet T cannot be seen during grease waste hauler pumping and there is no access manhole over outlet T, then an access manhole must be installed.

No Outlet T installed
(Allows FOG to be discharged, which causes sewer blockages)

Proper Outlet T installation
(PVC schedule 40, to within 12" of the tank bottom prevents FOG discharge)

Required Grease Interceptor Maintenance:

1. **Clean or pump complete contents of interceptor at a minimum of every 90 days.** Some facilities may need to clean monthly or every two months to prevent exceeding 25% of capacity of interceptor with grease and food solids. Check with your grease waste hauler to determine if your interceptor pump frequency needs to be 30, 60 or 90 days.

2. **Make sure that complete contents of interceptor are pumped.** No partial pumping (grease layer only) is allowed. Contact your grease waste hauler to make sure complete contents are pumped.

3. **Keep records onsite of interceptor pumping or cleaning for inspectors**. Pump records must include date pumped, volume pumped & grease waste hauler ID info. Also, review your FOG permit and keep the permit at your facility.

4. **Have your grease waste hauler complete a Metro Water Services Grease Interceptor Certification Form each year and submit (mail) the form to Metro Water Services.** Correct any deficiencies noted on certification form, especially missing outlet T or deterioration of the interceptor.

5. Do NOT dump any oils or grease into floor drains, kitchen sink drains, mop sinks, sanitary sewer connections or storm water grates. Properly dispose of oils and grease in recycle bins or containers.

6. Review Best Management Practices (BMPs) in this brochure with all employees.

Local Stormwater News Article 1 (Page 1)

Tennessean – November 9, 2005

More help available for stormwater drainage problems

By NANCY DEVILLE
Staff Writer

SOUTH INGLEWOOD — Help with ongoing flooding problems is on the way for the residents of the Concerned Citizens of South Inglewood Neighborhood Association.

The Metro Water Services' Stormwater Division has began to rectify problems in the area. Neighbors have been battling drainage issues for decades, and after several meetings, Metro will spend approximately $86,000 to improve drainage.

The project is being designed to address flooding problems in the Northview and Bronte avenues area. Once the issue is corrected, stormwater officials predict it will help much of the South Inglewood community.

The consultant company is finishing the project design; and once it is complete, contractors may begin to submit bids.

Martha Jones, a longtime resident of South Inglewood, said the area has had flooding issues for between 20 and 25 years.

"The problem has been continuing to get worse, especially after they built the Litton Apartments," she said. "The neighbors have been receptive to them coming in and doing the work. We are very appreciative that they came up with the idea to make us a priority and are showing some interest in trying to do something about our problem."

Local Stormwater News Article 1 (Page 2)

Tennessean – November 9, 2005

Stormwater is an issue that plagues many Davidson County communities. Before the stormwater division becoming a part of Metro Water Services, there was not enough funding for needed projects, said Sonia Harvat, spokeswoman for Metro Water Services. There now is additional funding and staffing to address flooding issues.

When a complaint is received, a staff member is sent to determine what the cause of the issue is and what can be done to possibly fix it. The division will fix issues such as a clogged storm drain that needs to be cleaned out or a ditch redefined. Anything larger is sent to a consultant who does a survey and then creates a plan that they suggest would solve the problem. The Stormwater Division then places the complaint through a grading system that determines its priority.

"Not only do we have staff out working every day cleaning storm drains and ditches, we are also trying to educate people on how to prevent flooding," Harvat said. "A lot are issues that people are not aware of.

"We are putting together larger projects where we help entire neighborhoods or streets rather than one individual property owner. Even with additional funding and staffing, there are still limitations. So we have to prioritize them according to a set matrix that we have." •

Local Stormwater News Article 2 (Page 1)

Nashville City Paper – December 19, 2005

Metro to open new dog park

By Judith R. Tackett, jtackett@nashvillecitypaper.com
December 19, 2005

After success with Nashville's two existing dog parks, Metro Parks is opening a third one on Flagpole Hill at Centennial Park.

East Nashvillian Edward O'Day visits the Shelby Dog Park with his new dog Annie, at his feet, as O'Day pets Layla, a friend's pooch, and his other dog Gillespie looks on. Photo by Judith R. Tackett.

Coinciding with the opening of the new dog park, which will occur at the end of this month or early January depending on weather conditions, Metro Parks will launch the Bag It campaign to remind dog owners to pick up after their pets.

Since Metro Council passed an ordinance this summer, Metro dog owners are required to pick up after their pets or face a fine of $62.50, the same amount it costs not to keep a dog on the leash on Metro Parks property.

Metro is fencing in new areas designated for dogs (and their owners) to run lose and socialize.

The newest dog park in the western part of Centennial Park on a hill also known as the First Amendment Hill will have two fenced areas, one for dogs weighing 25 pound and less, the other for dogs over 25 pounds, Parks spokeswoman Jackie Jones said.

"We anticipate that this is probably one of the more popular destinations for dog owners in the area," Jones said, adding the new dog park could attract even more dog traffic than the ones at Shelby and Warner parks.

The small-dog park at Flagpole Hill will include slightly less than the usual two acres, and both areas will offer a two-tiered water fountain with access for both people and their dogs.

The construction including fencing, signage and waste dispensers will cost $26,000, Jones said. In comparison, the Shelby and Warner dog parks cost $12,500 each.

"People have taken ownership of these dog parks," Jones said.

So far only one complaint about an aggressive dog at the Shelby Dog Park has been reported, and based on the information about that dog's owner Parks officials were able to send a letter to him. Other than that, there have been no complaints.

On the contrary, reports about dogs being off the leash in the Shelby Bottoms area and in Warner Parks are down, she said.

"Dog parks are arguably one of our most popular features," Jones said, adding people especially in the Shelby Park area report that the dog park has helped them meet their neighbors and fostered a little community among regular dog owners.

Local Stormwater News Article 2 (Page 2)

Nashville City Paper – December 19, 2006

Event Submissions
Contact Us
Link to Us
Pick-up Locations
Request Delivery
Invite a Friend

"It's a positive experience all way around," Jones said.

Jones said to report misconduct dog owners and others can contact the Parks Police at 880-3429 or the main office at 862-8400 with detailed information on the dog owner.

For more information on the dog parks and Metro's dog policy visit www.nashville.gov/parks/dog_page.htm.

• *Tennessee Co trading stock*
Lifes
• *Garing's Circu Nashville's traditic heritage*
• *Short and swe for quirky stocking*
• *Ryan Adams is release in prolific*
• *Belmont speci and nationally*
• *City Pick*
Spo
• *Upset eludes T*
• *Titans' offense*
• *'Dores unleash Alabama A&M*
• *Foster's dry sp teammates*
• *Preds prove to*
• *Lady Trojans i*
• *Dunlap rallies Ryan*
Edito
• *This Christmas needy charity*
• *Letters to the E*

Home | News | Business | Noticias | Sports | Lifestyle | City Seven | Profits and Profiles | E

Local Stormwater News Article 3 (Page 1)

Nashville City Paper – September 7, 2005

DAVIDSON A.M.

WEDNESDAY, SEPTEMBER 7, 2005

GROWTH & DEVELOPMENT

Wal-Mart worries some residents

Flooding, traffic among concerns

By SUZANNE NORMAND BLACKWOOD
Staff Writer

NOLENSVILLE ROAD — Although the approval process for a planned Wal-Mart Supercenter on Nolensville Road has been going smoothly, some nearby residents are concerned the engineer is not doing enough to address flooding issues.

They also worry about how the mega-store would affect traffic.

The engineer for the new Wal-Mart, which would be at the intersection with Old Hickory Boulevard, was granted a variance by the Metro Stormwater Management Committee to construct a sewer line within the Whittemore Branch floodway and floodway buffer.

Both Whittemore Branch and one of its tributaries divide the Wal-Mart property in different locations.

The variance request also was to allow for "uncompensated fill, provided there is no rise of the 100-year flood elevation."

When a developer places additional dirt on a site after excavation, it can alter the course of storm water runoff and cause flooding in some instances.

The decision whether to grant the variance request was deferred from the June 16 meeting to the July 7 meeting to allow the engineer to make changes to the plan that were recommended by the committee.

Changes included addressing stream bank stability, providing sufficient storm water detention and showing more clearly the final floodway and floodway buffer.

Jennifer Knauf, Metro's stormwater management coordinator, said most variance requests have to do with buffer disturbances or building in a floodplain.

"We apply a buffer 50 feet from the floodway line," she said.

Danny Smith, an engineer with Metro Water Services, said the plans still have to be approved before a grading permit can be issued.

This can be a lengthy process, lasting three to six months, he said. Part of the reason is because the plans also have to be reviewed by the Federal Emergency Management Agency.

But Smith said the plans would most likely be approved.

"It's very rare that we cannot work things out," he said. It's seldom "that we just kill the development."

The engineer, Gresham Smith and Partners, also had to acquire an Aquatic Resources Alterations Permit. This is a requirement of the state anytime a development alters a stream or wetland, resulting in water quality issues.

▶ See WAL-MART, Page 2

ADULT EDUCATION

Nashville State opens second campus

About 100 students enrolled in first term of school at former Tennessee

Local Stormwater News Article 3 (Page 2)

Nashville City Paper – September 7, 2005

Wal-Mart: Traffic, flooding are concerns for new store's neighbors

FROM PAGE 1

"Our primary concern was Whittemore Branch, which has the endangered Nashville crayfish," said Mike Lee, an environmental specialist for the Tennessee Department of Environment and Conservation.

"We wanted to be as protective of that as we could."

Albert Robinette, who lives in the nearby Sugar Valley subdivision, said he, along with others, are excited about Wal-Mart coming to that corner."

"There are some concerns still about the traffic,' he said. "But to remove some of the eyesore in that location, as well as the convenience of having a store of that type that close, will probably be worth the congestion."

Brookview Estates resident George Benham disagreed. He said traffic is going to be "a nightmare" for people traveling to and from work.

And as far as he knows, there are no plans to widen Nolensville Road, he said.

But, Benham added, "Our main concerns are the flooding issues."

With the recent hurricane, he said, "we had quite a bit of runoff." And that was a lot less than initially expected.

Nonetheless, he said, "it was rather scary at times for us."

Sandra Hutchings, president of the Brookview Estates Area Residents, said flooding in her neighborhood has just gotten worse since she moved there in 1986.

Although the engineer's plans will most likely be approved, she said, she doesn't feel a truly comprehensive storm water management study has been conducted. This is a requirement outlined in the Southeast Community Plan regarding development near Whittemore Branch.

The Southeast Community Plan is one of several such plans throughout the county that help Metro planners guide Nashville's future growth.

"The residents of Brookview Estates and other subdivisions in the Bell Road corridor are still very concerned and have no doubt that the Wal-Mart will only exacerbate our flooding problems," Hutchings wrote in a memo to *The Tennessean*.

"We've had a number of neighborhood meetings (on the project)," said Michael Cochrane, who represents engineering firm, Gresham Smith and Partners.

"We have gotten the permits that are required," he added.

Cochrane said his firm has tried to be "extremely sensitive" to the concerns of the neighbors, Metro and the state.

Cochrane also said his firm is taking a number of measures to minimize flooding near the development.

"We've incorporated (permeable) pavement, which lessens the runoff on the site," he said. "We're doing things to stabilize the bank and the (stream) bottom."

Also, he added, there will be no changes to the floodplain outside the property line or within 500 feet inside the property line.

A measure that goes above and beyond the normal requirements, Cochrane said, involves providing storm water detention for the 100 year storm. ■

Davidson For the Record

block Elm Hill Pike
Woodbine
3:30 a.m., nonresidential burglary, 2700 block Nolensville Road
1:03 p.m., residential burglary, 100 block Antioch Pike

These are the most serious calls handled by the Metro police on Wednesday, Aug. 31, listed by time, crime reported and address. Some reports may be unfounded. Police calls are listed by police precinct or town.

Antioch
8:06 p.m., residential burglary, 300 block Arbor Ridge Drive
9:09 p.m., residential burglary, 400 block Black Mountain Drive
9:30 p.m., holdup/robbery, 900 block Richards Road
Central
1:40 a.m., holdup/robbery, 1200 block Joseph Ave.
1:46 a.m., hazardous leak, at Interstate 40 E. & Fesslers Lane
8:29 a.m., residential burglary, 700 block Lenore St.
9:11 a.m., nonresidential burglary, 500 block Russell St.
5:34 p.m., holdup/robbery, 600 block Murfreesboro Pike
Downtown
12:36 a.m., residential burglary, 900 block Broadway
Oak Hill
1:06 a.m., nonresidential burglary, 4800 block Franklin Road
Priest Lake
10:11 p.m., residential burglary, 600 block Daisy Court
South
12:54 a.m., holdup/robbery, 1100 block Thompson Place
2:34 a.m., rape, at Murfreesboro Pike
11 a.m., nonresidential burglary, 2100 block Elm Hill Pike
3:15 p.m., residential burglary, 1900 block Enclave Circle
6:46 p.m., residential burglary, 1900 block Murfreesboro Pike
6:47 p.m., residential burglary, 5300 block Cane Ridge Road
Tusculum
4:49 p.m., rape, at Wallace Road
Woodbine
5:06 p.m., holdup/robbery, 2900 block Sidco Drive

These are the most serious calls handled by the Metro police on Thursday, Sept. 1, listed by time, crime reported and address. Some reports may be unfounded. Police calls are listed by police precinct or town.

Central
12:28 a.m., residential burglary, 600 block Shelby Ave.
7:53 p.m., cutting/stabbing, at Titans Way and Victory Ave.
11:07 p.m., residential burglary, 200 block S. Fourth St.
Downtown
10:49 p.m., nonresidential burglary, 300 block Broadway
Providence
3:19 a.m., shooting, 4600 block Nolensville Road
South
10:41 a.m., residential burglary, 5900 block Edmondson Pike
10:24 p.m., kidnapping, 6300 block Nolensville Road
Tusculum
7:48 a.m., residential burglary, 3100 block Ellington Circle
9:35 a.m., nonresidential burglary, 5400 block Nolensville Road
Woodbine
5:29 p.m., residential burglary, 400 block Welshwood Drive
11:58 p.m., nonresidential burglary, 2700 block Eugenia Ave.

Local Stormwater News Article 4 (Page 1)

Tennessean – May 27, 2006

THE TENNESSEAN

LIVING

3D DIVIDING A PLANT, STEP BY STEP

Do It Yourself!

3D GET YOUR GRILL BACK IN THE GROOVE

SATURDAY, MAY 27, 2006

Ms. Cheap
Mary Hance

Put rainwater to good use with free barrel

With all of the rain we've been showered with this spring, I surely wish I had put a big ol' rain barrel under one of our house's downspouts to collect all that free water.

Especially since I just learned that Metro Water Services Department will actually give you a 55-gallon plastic barrel for the asking. FREE for any resident of Davidson County!

The Water Services folks won't put your barrel together for you, but they tell you exactly what you need to assemble it and give you a complete "How to Make a Rain Barrel" handout.

I'm not sure that I (personally) could do the whole project on my own, since I'm not too handy with a drill. But what a great activity for a neighborhood, or a youth group, Scout troop or people with friends who know how to use a drill.

You could set it up like an assembly line and do multiple barrels — with the driller going first and the rest of us not-so-handy-but-willing worker bees finishing them off with a screwdriver, utility knife and needle-nose pliers.

More inside
A step-by-step guide to making a rain barrel.
On Page 6D

Although you can't drink the water, these barrels are really great for gardeners — especially if your downspout (you can cut off the downspout to accommodate the height of the barrel) is close enough to your garden to let you hook up a soaker hose and just leave the spigot open most of the time. But even if your garden plot isn't conveniently close, a long hose will do the trick.

Getting the barrel set up really is a pretty simple process.

I know you're probably thinking being cheap is the sole motivation for installing a rain catcher (and that was what initially sparked my interest), but I'm afraid that even the cheapest of us might be disappointed to learn that capturing 55 gallons of water will save only a pittance — about 25 cents on your monthly bill. Fortunately there are other plusses, like helping the environment.

The University of Arizona has a Web site that offers these top reasons to have one: It reduces the amount of water consumed by a household; homeowners can save money on their water bill; it gives homeowners the satisfaction of knowing they're conserving our limited water resources; it provides additional water for landscaping; and it reduces flooding of streets during rainstorms by capturing the water.

Oh, and of course using the natural rainwater should make your plants happy, too.

"Rainwater is better for your plants than chlorine water anyway," says Water Services' Randy Gupton, as he showed me how to assemble one of the giveaway barrels.

Randy and his team (who were very good with the drill and other tools) can put one together in 10 minutes flat. Randy figures the additional parts you'd have to buy to go with the free barrel — a spigot, rubber washer, a brass overflow valve, some screws, Superglue and a sealant — would run about $7-$8.

So I say go for it — call Metro Water's Sonia Harvat at 862-4494 and arrange to pick up a barrel and get your assembly line going.

I could just kick myself for not getting on to this before the spring monsoon hit — just think of all of the inches (gallons) of rain I've missed over the past few weeks.

Oh, well, there are always rainy days ahead, and this is too good a deal to pass up. Stay cheap! ■

Reach Ms. Cheap at 259-8202 or at mscheap@tennessean.com.

Pinch coleus plants to make them bushier.

JUNE

Change water in bird baths daily to reduce mosquito populations.

LANDSCAPE & GARDENING CALENDAR

Plants will let you know when they want water

By GLORIA BALLARD
Staff Writer

Summer is coming. There are two things your garden needs to look its best in June's sweltering heat: water and mulch.

As a rule, a garden needs about an inch of water a week. If you pay attention, your plants will let you know when it's time to water, says Tom Christopher, in an article titled Water-Wise in the spring issue of Country Living Gardener magazine.

"The first symptom of dehydration, the warning that your plants are short of water, is 'flagging' — the color of the leaves begins to dull and foliage starts to droop," Christopher says. This may only be a reaction to a hot, sunny day, when plants can't take in water fast enough to replace what's evaporating. But if they don't perk back up in the cooler evening, water the next morning.

The benefits of using mulch are twofold: It helps the soil retain moisture, so plants don't dry out so quickly, and it suppresses the sprouting of weed seeds. Spread it 1-3 inches thick around annuals, perennials and shrubs, keeping it about ½-inch away from the base of plants, suggests The Home Depot's "Gardening 1-2-3."

With a watering plan in place and mulching done, sit back and enjoy the results of your planning and planting. ■

Gloria Ballard is a staff writer at The Tennessean. Reach her at 259-8062 or gballard@tennessean.com.

1 THURSDAY
Making vacati
Don't forget al
den. You can t
turn water on
pre-set sched
still, make arra
with a garden
or hire a neigh
to water the g
you're away.

2 FRIDAY
Warm-season lawns, such as Bermuda or zoysia, can be planted this month, ideally before June 30. (Don't try to plant a cool-season grass such as fescue).

3 SATURDAY
Gates or inside garden tour. Seven gardens in the Green Hills/Belle Meade area, 10 a.m.-5 p.m. $12 in advance; $15 day of tour. Benefits Monroe Harding Children's Home. Info: 298-5573, ext. 115.

Watch plants for signs they need water.

5 MO
Herbs ca
well in co
but make
they're v
frequent
during h
weather.
Water her
quently in

6 TUESDAY
Nashville Rose Society meeting, 7 p.m. at Cheekwood (refreshments at 6:30 p.m.). Topic: New Roses and How They Got Here, by Eddie Edwards. Free.

7 WEDNESDAY
Spring-planted lettuce is ready to bolt — that is, send up flower stalks. You've waited too long, and it is too bitter to eat, so pull it up and add it to the compost. Plant again at the end of summer for a fall crop.

8 THURSDAY
Make time for deadheading — snipping off faded blooms of perennials and annuals. Plants will bloom longer.

10 SATURDAY
Chrysanthemums may be showing buds, but pinch them back to encourage bushier plants and to have better blooms this fall.

Protect grass by cutting only one-third its height when you mow.

11 SUNDAY
As a rule, the garden needs one inch of water a week. Measure it by setting out a flat, shallow pan where it will collect water from your sprinkler.

14 WEDNESDAY
Snip faded flowers off daylilies, but allow foliage to remain.

15 THURSDAY
Buy sprinkler timers or get a friend to water your garden while you're away.

17 SATURDAY
When you mow, cut lawn grass only by one-third its height. Mowing shorter stresses the plants.

18 SUNDAY
Father's Day

19 MONDAY
If you have houseplants that are spending the summer outdoors, don't forget about them. Check frequently to make sure they're getting enough water and not being bothered by pests. Make sure they're protected from wind and heavy rain. After a rain, check the drainage trays and dump out accumulated water.

Don't forget to check outdoor houseplants for pests.

21 WEDNESDAY
First day of summer.

22 THURSDAY
Keep the mosquitoes at bay. When you're outdoors, use mosquito repellent. Reduce mosquito populations by eliminating standing water in your landscape. Change the water in bird baths daily.

24 SATURD
If you hav
new perer
watch the
it doesn't
need to b
regularly t
sure they
good start

25 SUNDAY
Use water efficiently. Water lawns early in the morning (ideally before sunrise) to lessen evaporation. Don't water on a windy day. Water deeply and less often; set up your watering system so that it applies water to the grass, not to the driveway or sidewalk.

28 WEDNESDAY
Clip blooms off basil; snip and use the leaves regularly to keep the plant bushy and attractive.

29 THURSDAY
If bearded iris foliage is droopy, cut it to a fan shape 4-6 inches high.

Trimming can be an important part of growing healthy plants.

30 FRIDAY
Pinch coleus plants to keep them from getting leggy.

Don't forget . . .

- If you're heading out of town, n plans for your garden.
- Tall lilies tend to lean, so stake t keep them upright.
- Clematis likes its roots to stay c mulch, if necessary.
- Ferns and other porch plants m out quickly in the heat. Water them quently.
- You can speed decomposition i compost pile by turning it once a w

Sources: The University of Tennessee Extension; "The Complete Houseplant Survival Manual" by Barbara Pleasant (Storey Publishing); The Home Depot's "Gardening 1-2-3" (Meredith Books).

Local Stormwater News Article 4 (Page 2)

Tennessean – May 27, 2006

THE TENNESSEAN www.tennessean.com

DO IT YOURSELF!

Try these plants you just can't kill

The Washington Post

Let's not kid ourselves. Every plant will die if not properly cared for. But that doesn't mean some aren't far more forgiving than others. Before you hang up that spade for good, listen to some Washington, D.C.-area experts' advice on plants that take a licking yet keep on ticking.

For plants that give you a lot for a little (effort, that is), Randy Best of Behnke Nurseries recommends nandinas (sometimes known as heavenly bamboo), junipers and dwarf evergreens. "And if you watch your watering, azaleas and herbaceous perennials are fairly easy to take care of," Best says.

Brian Barr of Hillwood Museum and Gardens agrees. "To me, given the right situation, azaleas are hard to kill. . . . You also see forsythia everywhere, which can be great when it's allowed to grow to its natural shape and size. Everyone wants to prune it like a little meatball."

Forsythia is also tops for Brookside Gardens' Phil Normandy. "Look around, if you're seeing it everywhere then there's a good chance those plants are forgiving," he says.

While hellebores are not unkillable, Mary Kay Crow at Tudor Place Historic House and Garden says some varieties of this evergreen perennial can be rewarding for the novice gardener. "It will take our clay soil, sun and shade." And you'll have flowers midwinter to spring. ■

▶ Metro Water Services will supply a rain barrel free; you have to assemble it. Read more about it in Ms. Cheap's column. **On Page 1D**

How to make your own rain barrel

A rain barrel can capture water for use in your garden. Residents of Davidson County can receive a free 55-gallon barrel from Metro Water Services or purchase one at a hardware store.

Barrels come in different sizes, but 55 gallons is a good size for a roof up to 2,000 square feet. Any rain barrel should be "food clean" plastic with a removable lid for cleaning and assembling. Once you put it together, drill holes in it to capture water and screw in a spigot and overflow valve, your garden will be ready for the summer heat.

Step by step

Clean and rinse your container with a mild soap and water. Then, to attach the spigot assembly, drill a 1-inch hole with your hole saw or drill bit, just off the bottom of the container. Put it as low as possible for easy maximum water use. (The barrel works best if propped on cinder blocks, which is why you want the spigot so low.) Next, drill a 1-inch hole about an inch below the rim to attach the overflow valve assembly. This hole can go anywhere around the barrel at that level. Then, use the 1-inch drill bit to make a dozen or so holes in the lid, which will let rainwater enter the barrel. Use a utility knife to clear plastic scraps from around the holes.

Now, to attach the spigot hardware, wrap the barrel end of the spigot three times around with Teflon tape and then screw in the spigot squarely. It should go in by hand. Cover one side of a rubber washer with strong glue. Reach into the barrel and work it over the threads, flush with the barrel side. Screw on the locknut and finish tightening by turning the spigot while holding the locknut with a wrench or pliers. (You may need a second person to turn while you hold.)

To attach the overflow hardware, wrap the longer end of the overflow valve with Teflon tape three times and then screw it into the overflow hole by hand, or use a wrench or pliers if necessary. The outside threads should be able to connect with a standard-size garden hose to divert the overflow. Cover one side of a rubber washer with glue and reach into the barrel and work it over the threads, flush with the barrel side. Screw on a locknut as far as possible by hand on the outside threads. Then hold the locknut while tightening overflow valve with wrench or pliers until it is very tight. If you don't think you have a secure seal with the valves, take a tube of all-purpose silicone sealant and apply a bead where each of the valves meet the outside of the barrel.

Finally, trace the outline of the lid on a mesh fiberglass screen and cut it to size. This screen is designed to keep mosquitoes out, so screw it on, if necessary, to hold it in place.

Now you're ready to elevate the barrel (with concrete blocks or material) to make the spigot more accessible and to increase water pressure. ■

Source: Metro Water Services

MARY HANCE / THE TENNESSEAN

Walter Jumper, from left, Philip Reding and Randy Gupton of Metro Water Services show off the rain barrels you can get free for your garden. All you have to do is assemble them.

Tools and materials

Rain barrel
¾-inch hose bib spigot
¾-inch galvanized locknuts
¾-inch brass or plastic overflow valve
Rubber washers with a 1-inch inner diameter
Teflon tape
Strong glue
Silicone sealant
Drill
1-inch hole saw or drill bit
Utility knife
Needle-nose pliers or wrench
Screw driver and 6 screws
Mesh screen for top filter
Concrete blocks

Local Stormwater News Article 5 (Page 1)

Tennessean – July 10, 2006

THE TENNESSEAN

LOCAL NEWS B

MONDAY, JULY 10, 2006

Water budget cuts hinder repairs

Metro Council postpones mayor's proposal to end bulk discounts

By LEE ANN O'NEAL
Staff Writer

Jerry Brown has been calling the city since 1997 to get water runoff problems in front of his Goodlettsville home fixed.

After cuts by the mayor and Metro Council to the Water Department's budget, Brown likely will still be waiting this time next year.

The mayor proposed reducing the stormwater operating and capital budget from $19.4 million last year to $15.1 million this year.

The council pared the water agency's budget by an additional $2.19 million during its budget deliberations, money that water officials said would have to come from stormwater work as well.


HAUSSER


SHULMAN

The council essentially postponed a measure Mayor Bill Purcell proposed to bring in that roughly $2.19 million from groups such as Vanderbilt, Opry Mills and others that receive bulk water discounts. Instead of ending the discounts this year, the council postponed it until next July.

"That's so frustrating," said Brown, 65, whose project was slated to be done this summer. "I've just practically gave up. I just can't get anything done."

The ditches on Brown's 5-acre lot have been eroded by rainwater that fills the creek, Brown said as he pointed to an electric guide wire that once was anchored in the ground but now extends into

▷ Please see WATER, 3B

Teens welcome chance to help

Volunteer program an opportunity to lend hand, have fun

By CHELSEA HADAWAY
Staff Writer

Maya Johnson decided it's more fun playing jail when the big kids play.

"One of the big kids runs away and then we go get him. Then the big kids try and get him out again," explained Maya, 5, of their frequent playground game at the

Alderman: No conflict in funding his own agency

He abstained from final budget vote

By ANNE PAINE
Staff Writer

HENDERSONVILLE — A $9,999 request from the Henderson-

Local Stormwater News Article 5 (Page 2)

Tennessean – July 10, 2006

STORMWATER WOES

Cuts in the Water Services budget totaling $6.47 million will force delays of 31 stormwater projects planned for this year.

Delayed capital stormwater projects of $100,000 or more

1	2700 Bronte Ave.	$492,366
2	3138 Larkspur Dr.	$373,120
3	509 Patterson St.	$352,338
4	112 Glenrose Ave.	$233,009
5	249 Lovell St.	$228,836
6	2629 Old Buena Vista Pk.	$199,934
7	1601 Northview Ave.	$150,000
8	50 Visco Ct.	$100,000

THE TENNESSEAN

MANDY LUNN / THE TENNESSEAN

Jerry Brown points to water damage in his front yard on Shaw Road. He has been trying to get Metro to fix the problem since 1997.

Water: Agency has a long to-do list

FROM PAGE 1B

the ditch.

Brown, retired from the Nashville Fire Department, said he's spent $2,000 of his own money to try to fix the problem, including $1,200 to clean the ditch. His efforts haven't stopped the erosion.

Metro Water officials said the budget changes would prevent them from applying for a federal grant that last year added $3 million to their budget because they don't have money to match the grant.

The agency will have $9.6 million for stormwater, enough to work on smaller right-of-way projects, such as ditch and storm-drain cleaning, but not enough to undertake any new construction projects such as work at Brown's home, said Metro Water spokeswoman Sonia Harvat.

Councilwoman Ginger Hausser, one of the sponsors of the bulk discount delay, questioned whether the administration had "to throw people off the stormwater list" to make up the council change to the overall water budget.

"There was more than enough money in Metro Water's reserves to deal with what is essentially a 1 percent reduction in their budget," Hausser said.

Councilman Jim Shulman pointed to $52.9 million listed as cash on hand at the water agency at the end of fiscal year 2005 as a possible source, but Metro Finance Director David Manning said that

MORE ONLINE

- View a database of stormwater projects by address and priority.
- View a list of the groups with multiple water meters that will continue to get "bulk" discounts on their water rates.

Go to **Tennessean.com** and type the keyword **WATER**.

MAKE YOUR VOICE HEARD

- **Mayor Bill Purcell**
  Phone: 862-6000
  E-mail: mayor@nashville.gov
  Mail: Metro City Hall, 225 Polk Ave., Nashville, TN 37203
- **Metro Council**
  Phone: 862-6780.
  E-mail all council members: councilmembers@nashville.gov.
  Mail: 225 Polk Ave., Suite 102, Nashville, TN 37203.
  Web: www.nashville.gov/council.
- You may wish to copy your e-mail to politics@tennessean.com.

about $100,000 a year and they learned of the proposal "about a week before it came up for a vote."

Ellenburg said the university didn't have a clear understanding of what would constitute hardship under the measure.

"We did not think we could rely on that," Ellenburg said.

But Brown said he's frustrated and feels overlooked in favor of companies, universities and the

FIXES PRIORITIZED

- Stormwater issues are evaluated and scored to determine which projects are fixed first. Factors include whether human health or safety is affected and how often the flooding occurs. For more information: www.mwsstormwaters.com.

SOURCE: METRO WATER SERVICES

like.

"They always take care of the big guys. The little guys have to suffer," he said. "That doesn't surprise me."

But Shulman, of Green Hills, said the council was trying to avoid what would have been "a pretty hefty increase" without notice. "There are small businesses, there are nonprofits, there are churches" on the bulk-rate list, he said. "There were big entities. There were also individuals on that list."

Staff Writer Michael Cass contributed to this report. Les Ann O'Neal can be reached at 259-8814 or loneal@tennessean.com.

EDUCATION NOTEBOOK

Donelson Christian team wins marketing contest

What: Three area high schools participated in the Boy Scouts of America's Explorers program, designed to give high school students real-life work experience. The program teamed up with Shoney's Restaurants Marketing Department.

Who: Teams from Brentwood High, Ravenwood High and Donelson Christian Academy designed and executed marketing strategies to increase sales at three area Shoney's. The six students on the DCA team won the marketing competition.

When: The competition was January through March, and the award ceremony was May 18.

Where: The DCA team was assigned to the Shoney's on Donelson Pike; Brentwood had the one on Old Hickory in Brentwood; and Ravenwood had the one on Highway 96 in Franklin.

How: The teams were judged on creativity, execution and same-store sales. DCA focused on couponing and conducting Shoney Bear pep rallies at elementary schools. The same-day sales at their Shoney's restaurant increased by 12 percent.

California couple given award from Lipscomb

What: Jerry and Lori Rushford of Malibu, Calif., received Lipscomb University's annual Barnabas award, which is given each year to someone who has provided an encouraging ministry to the Churches of Christ community.

Who: Jerry Rushford is a professor at Pepperdine University and has written several books. Lori is the education program administrator for Pepperdine's Straus Institute for Dispute Resolution.

When: The award was presented Thursday at Lipscomb's Summer Celebration lecture series.

Where: The dinner honoring the Rushfords was held at Lipscomb's Allen Arena.

Why: Jerry Rushford became the director of church relations at Pepperdine University in 1982 and built up the Pepperdine Lectureship into the largest lecture series within the Churches of Christ fellowship.

Nashville native studying apartheid in South Africa

What: Gabby Schonder of Nashville is in Cape Town, South Africa, studying the effects of apartheid education policy there. She is using museums and the University of Cape Town manuscript and archive library.

Who: Schor
drix College
African histo
Oxford last y
When: This
Where: Cap
Why: "Throu
hoping to be
causes of th
that continue
colored Sout
said in a stat

High sch moving t

What: The T
Press Associ
ations from t
see's College
Vanderbilt Ur
Who: Vander
cations will n
will incorpora
Scholastic Pr
organization.
How: H.L. Ha
the MTSPA ir
the past three
executive dire
THSPA. At TH
expand servic
bership, takin
more central l

UT studer Laureate

What: Two Ur
students were
annual Lindau
reates and Stu
a gathering of
researchers ar
across the wo
Nobel Laureat
physics and pl
Who: Rachel L
student at the
Genome Scier
and is sponso
National Labor
a graduate stu
is sponsored b
Associated Ur
When: The me
in Lindau, Ger
Why: Nobel la
and participate
cussions with

Metro sch union win

What: Metropo
Schools and th
ville Education
national partne
by the Nationa
tion, the Satur
Auto Workers,
local partnersh

Local Stormwater News Article 7

Tennessean – October 16, 2005

HOME: NEW CONSTRUCTION

New building practices help environment and save money, too

Developers offer 'green' design in Germantown

By MEGAN MORIARTY
For the Tennessean

Sure, many want to help the environment, but sometimes people simply can't find the time to lug dozens of diet soda cans or old newspapers to the recycling center.

Luckily, individuals are able to help the cause daily without ever having to leave their homes — simply by living in environmentally friendly structures.

Developers such as The Lawrence Brothers LLC and Germantown Partners LLC, both of which focus their efforts on Nashville's historic Germantown neighborhood, are leading the charge and are in the midst of creating homes with a number of "green" elements incorporated into the design.

Germantown Partners, made up of Scott Chambers and Andrée LeQuire, began their efforts to improve the historic neighborhood eight years ago by constructing single-family homes on Fifth Avenue North — a seemingly doomed piece of land once slated to house an auto emissions testing center.

Since then, the two have developed a number of other residential and retail projects, including a mixed-use building and Germantown Court, also on Fifth Avenue North, and they are creating Monroe, eight three-story condominiums.

In addition to using environmentally friendly products inside the structures, Chambers and LeQuire used permeable concrete in the parking lot of the mixed-use building, which houses the Germantown Cafe, their offices and six second-story condos, in an attempt to improve the environment.

Unlike traditional concrete and asphalt that hold on to pollutants such as motor oil, the permeable pavement is designed to allow storm water to be absorbed by the paving surface and filter down into the ground below, reducing storm water runoff and providing natural irrigation.

Down the street, the Lawrence brothers, made up of Skip, Fred and Bill Lawrence, who have built a number of single-family homes in the area, are building Morgan Park Place. It's a mixed-use condominium and specialty retail shop on Van Buren Street between Third and Fifth avenues north.

The eco-friendly, energy-efficient structure — which is a co-development project with New Urban Construction LLC, composed of Tony Werthan and Todd Zeitlin — is being built to incorporate the Low Impact Development concept, an environmentally friendly approach to developing land and managing storm water runoff.

"It's consistent with the quality of building that we're committed to accomplishing," Skip Lawrence said. "And it's consistent with our attitude about our responsibility to our community and our neighbors — and ourselves."

In addition, the developers have incorporated "rain gardens" into the design. These will capture rainwater and help it soak into the ground as opposed to sending it to the river, which can cause flooding.

Morgan Park Place also embraces other aspects of water quality, energy efficiency, environmental impact and responsible building practices. The high performance units will feature energy-efficient heating and cooling systems designed to improve indoor air quality, as well as a number of sustainable materials including carpets, unique flooring and special paints that reduce the amount of chemicals released into the air.

Lawrence said the improved air quality is an important factor for buyers. The Lawrence brothers also are using permeable paving materials in the parking areas.

In addition to helping Mother Earth, implementing "green" elements into your home can save money in the long run.

"Whatever the increase in cost is, it's far outweighed by the savings," Lawrence said. "And the ultimate owner will realize the significant saving in their energy bills. We're using more efficient, smaller . . . systems that will require less fuel. The houses will heat and cool quicker and stay hot and cold longer — the savings are significant to the buyer."

Lawrence believes using environmental materials and techniques will soon become the standard.

"It's a trend throughout the country," Lawrence said. "And I think it's how everything will be built in a couple years." ■

Virginia couple proves how 'green house' can be rewarding, make life comfortable

By KATHY VAN MULLEKOM
Knight Ridder News Service

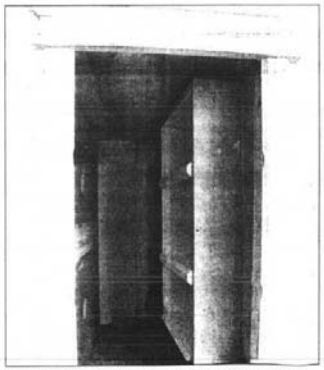
A "green house" benefits the environment — and pads your pocketbook with extra green, says builder John Harris.

"When you really want to go green building or fixing up a home, there's a lot you can do," he says. "Most of these products save you money in the long run."

To prove his point, he rattles off examples of simple energy-efficient items such as programmable thermostats that automatically adjust your home's temperature while you are away. Ceiling fans, extra insulation and double-pane windows are other affordable products that can be retrofitted into existing homes.

Harris and his wife, Debbie, have taken environmental health and energy savings to the next level, designing and constructing their house with the latest in green technology and materials. Debbie also worked clutter-clearing extras into the house: shelves, benches, closets and drawers that use every nook and cranny for organizing a busy lifestyle.

The home is one of 18 custom-built models in Broad Creek, a mixed-use, mixed-income neighborhood owned by the Norfolk Housing & Redevelopment Authority in Norfolk, Va. House down in price," he says of other models on the market. "It's an endless supply of hot



A cabinet made from MDF wood is part of the "green home." It functions as a door to a hidden area inside the kitchen.

PHOTOS BY KNIGHT RIDDER NEWS SERVICE

Homeowrama builder John Harris pulls back insulation to reveal spray-in foam insulation used to create a tighter more efficient home by preventing heat and cooling losses through cracks.

Local Stormwater News Article 8

Tennessean – March 8, 2006

Dirty deeds: Metro Water fines MBA

BY JUDITH R. TACKETT

Metro Water Services issued a stop-work order and fined Montgomery Bell Academy (MBA) $400 Tuesday for moving dirt on property it owns on Brighton Road next to the campus without a permit.

Sonia Harvat, spokeswoman for Metro Water Services, said the private school has been ordered to put up erosion control immediately to prevent the dirt from being washed off the site.

"If you are removing greater than 100 cubic yards of dirt, you have to have a permit," Harvat said. "Because what it can do, it can actually affect other properties and/or areas as far as causing stormwater runoff."

MBA officials could not be reached for comment.

MBA, 4001 Harding Road, has the option to either remove the fill in 30 days or submit plans and obtain appropriate permits and approvals within 60 days, Harvat said.

Metro Water Services received a call alerting it to the grading that occurred on property where the school razed homes to make space for tennis courts and parking space.

Neighbors have been wary of MBA's long-term plans and, in response to fears of the school's expansion, established the Woodlawn West Conservation Overlay District in 1999.

Originally neighbors wanted to include Brighton Road in the conservation overlay district, but compromised with MBA and included Kimpalong Drive, which is between Brighton Road and Woodlawn.

Photo by Steve Lowry

HONORING YOUNG ARTISTS

Celebrating the Tennessee Arts Commission's "My Home is Tennessee" art competition Tuesday are Jerry Jackson, 11, left, and Dantavious Wells, 11, who collaborated on a drawing together. Both are sixth-graders at Douglas Elementary School in Memphis. The winners of the statewide competition gathered Tuesday for a reception at the War Memorial Building. An exhibit of 132 students' work will be on display at Legislative Plaza during the month of March, which is Arts Education Month.

Mandarin offered at more schools

BY VANDANA ATREYA

With China rapidly morphing into an economic superpower, more and more Nashville schools are joining the race to teach Mandarin Chinese, the world's most commonly spoken language.

Already, two of the city's public schools are conducting classes in Mandarin Chinese, and Ensworth, a private K-12 school, is following suit. It is replacing French instruction classes with Mandarin Chinese in its lower school.

Starting this fall, students in grades K-4 will be introduced to the Asian language via an "exposure-based program," according to Nancy Scoville, foreign language department chair for Ensworth's lower and middle schools.

Ensworth is replacing French with Mandarin Chinese at the elementary level because it wants to be proactive with preparing its students for the language of the next generation, Scoville said.

"My crystal ball doesn't work any better than somebody else's, but I do know that the Chinese language is going to sweep the nation," she said. "Even the president has mentioned the importance of starting Chinese in schools across the country. We are starting classes at the elementary level because early exposure to a foreign language is when kids pick up the language the quickest."

Scoville added that French would continue to be taught in the fifth grade and upwards with seventh graders having the option to choose between French, Spanish, Latin and Chinese for high school credit.

Ensworth hopes to partner with San Fransisco-based Chinese American International school's language immersion program for curriculum development.

The University School of Nashville is the next private school thinking about starting Mandarin Chinese language classes on campus.

"It's part of a broader ongoing conversation about non-western languages," said Anne Westfall, director of development for USN.

Local Stormwater News Article 9

Tennessean January 29, 2006

re-election doesn't lead us," said Lydia Lenker, spokeswoman for the governor. "These are good issues."

Of course, a cynical columnist could also point out that it's smart media management to roll out a good news story a day for a couple of weeks before the State of the State speech.

"These were all things that we are just putting out there that are going to be in his budget," Lenker said. "We weren't planning a green week. We're just on track of getting the word out. There's so much in the budget and in the State of the State."

That's smart thinking by the governor's handlers, who are trying to show the state a man governing and not being led by crisis. But forget that game of inside baseball: these are solid proposals that will have real impact on people who like to play outside.

Gov. Phil Bredesen deserves full credit for that. He always did look good in green. ■

Gail Kerr's column runs on Sundays, Mondays and Wednesdays. She can be reached at 259-8065 or gkerr@tennessean.com.

SANFORD MYERS / STAFF

Andrew and Katie Bray, of Nashville, put a protective sleeve over a newly planted tree along the Seven Mile Creek behind the Edmondson Pike Branch Library yesterday during the Metro-sponsored event.

Residents assist in Metro stream project

They plant trees along Seven Mile Creek for sake of water, wildlife

By CLAY CAREY
Staff Writer

As Samantha Palko waded through the high weeds along the banks of Seven Mile Creek with her older brothers, she caught a quick glimpse of a true creek native, a small turtle.

It was the only wild animal the 12-year-old saw during the three hours she spent working along the creek behind the Edmondson Pike Branch Library yesterday, but she hopes her part in a Metro-sponsored effort to plant trees along its banks will make it a little friendlier for fish, reptiles and others who might want to call it home.

About 30 people helped plant 37 native tree saplings along a short segment of the creek behind the library, not far from Nolensville Road. The project, sponsored by Metro Water Services, is aimed at improving water quality and wildlife habitats along the stream.

"The roots in the trees will hold the soil," Metro Water Service spokeswoman Sonia Harvat said. "Once those trees are established, it will definitely help. It will also help the property value and make the property look nicer."

Sediment dumped into the creek by flooding and water runoff is the top polluter of Nashville's streams, Harvat said. When it gets into waterways such as Seven Mile Creek, it destroys the habitats of small insects and organisms that fish in a stream feed on. It also makes the water warmer, which throws off the creek's ecosystem, she said.

Seven Mile Creek was especially affected by water running off the parking lot of the nearby library. A buffer of trees will help keep that water from getting to the creek, lessen the soil erosion it causes and shade the water, keeping its temperature lower.

The planting also served as a learning experience for youngsters such as Palko, who were schooled on the impact that flooding and erosion can have on waterways before the project began.

"We know how important it is to keep the ground stable, so there won't be as much flooding," Palko said. ■

Clay Carey can be reached at 726-5933 or mcarey@tennessean.com.

Tell us how you get away

Do you know about a nice little patch of green space in Nashville? Where are your favorite spots to take a walk, have a picnic or simply get away from the city's pavement? Share those little spots of green space on our online forum. Go to **Tennessean.com** and type **GETAWAY** into the keyword search box.

TO REACH OUR NEWSROOM ■ If you have a news tip, call **259-8095**, fax **259-8093** or e-mail **newstips@tennessean.com** ■ If you have an event for Midstate Datebook, e-mail **datebook@tennessean.com**
■ Editors: Laurie E. Holloway, Deputy Managing Editor, **726-5944, lholloway@tennessean.com** • Ricky Young, City Editor, **259-8068, ryoung@tennessean.com**

www.tennessean.com

Water Works Agreement (Page 1)

bill hudson & associates, inc.

August 29, 2005

Mr. Michael Hunt
Program Manager
Metro Water Services/Stormwater Division
1607 County Hospital Rd.
Nashville, TN 37218

Dear Mr. Hunt:

Bill Hudson & Associates is the sole provider of the WaterWorks! program for the Middle Tennessee State University Center for Environmental Education. As such we are offering local storm water management agencies the chance to participate in the program. This letter serves as our proposal to provide radio and television public service announcements to support your public education and outreach programs.

Our firm will edit the television and radio PSAs produced for WaterWorks! to include a sponsorship reference to the Metro Water Services. The PSAs will then be distributed to radio and television stations serving Metro Nashville via the Non-Commercial Sustaining Announcement Program of the Tennessee Association of Broadcasters. Since these announcements are not paid commercials, neither Bill Hudson & Associates nor the TAB can guarantee that these spots will air at specific times. The scope of services provided is further detailed in the attached "Local Public Education and Outreach Opportunity" document.

Bill Hudson & Associates will provide a report to you listing the radio and television stations that did report airplay times and dates once a quarter after receiving the documents from TAB.

The cost of this service is $500 per quarter plus an annual production fee of $150. Bill Hudson & Associates will invoice you at the end of the first month of each quarter of your participation in this program. Your participation will begin October 1, 2005 through September 30, 2006.

With your payment and participation localized PSAs will be produced for cable and local access television.

If you have any questions please contact Melissa Douso at 615.259.9002.

Sincerely,

Wayne Edwards
Executive Vice President
Bill Hudson & Associates

Please sign and mail one copy to Bill Hudson & Associates, 1701 West End Avenue, Nashville, TN 37203.

Accepted by:

Name

Title/Davidson County, Metro Nashville Date Signed

1701 West End Avenue · Nashville, Tennessee 37203-2600 · www.billhudson.cc · ph: 615.259.9002 · fax: 615.256.0105

Water Works Agreement (Page 2)

WaterWorks!

Local Public Education and Outreach Opportunity

The WaterWorks! Broadcast Campaign

Local stormwater management committees and agencies now have a cost-effective and powerful tool to use in reducing stormwater pollution and in meeting EPA's public education and outreach requirements.

Background

In September 2003, the Center for Environmental Education at Middle Tennessee State University launched the statewide WaterWorks! Campaign. Designed to raise awareness of the role of individual citizens in reducing stormwater pollution, the campaign includes a series of professionally-produced radio and television public service announcements that have aired across the state.

To ensure that radio and television stations would air the announcements, WaterWorks entered into a contract with the Tennessee Association of Broadcasters (TAB) to utilize that organization's Non-Commercial Sustaining Announcement (NCSA) program. Once WaterWorks! provides TAB copies of the television and radio announcements, TAB handles distribution of the spots to their 331 member stations. TAB then provides a monthly report to WaterWorks showing the number of spots aired and their total value. Under terms of the contract, WaterWorks! is guaranteed a four-to-one ratio of advertising value generated to cost. In other words, a $10,000 investment would yield at least $40,000 in advertising value. The minimum cost of the program to WaterWorks! is $2,500 per quarter.

During the first two years, the actual results show that the advertising value of the WaterWorks! campaign was $771,914. The television spots aired more than 2,028 times and radio announcements had 32,749 airings.

Because not all stations report the airing of these announcements, we are confident that the true value of this program is actually much higher.

Starting in FY2006, the WaterWorks campaign will be expanded by a partnership with the Tennessee Department of Environment and Conservation (TDEC). Under this partnership, TDEC will provide matching funds for additional production and placement of radio and television public service announcements.

Some of the new ads produced under this partnership will be devoted solely to communicating the role automotive products play in water pollution from stormwater runoff and steps consumers can take to reduce pollution created from these products. TDEC will also support production of ads which simply include automotive products as sources of stormwater pollution (mixed ads).

Water Works Agreement (Page 3)

The Local Opportunity

Local stormwater agencies and committees can now participate in the campaign.

Broadcast television PSAs close with "A message from Tennessee broadcasters and your local stormwater management agency." These announcements will strongly promote the WaterWorks website, which will include a link to contact information for each participating local agency.

Ads for local cable television systems and local access channels can also be "localized" to include your agency name and telephone number.

Local stormwater agencies are urged to personally deliver the PSAs to their local access channels.

The minimum cost to a local entity would be $500 per quarter to participate in the TAB program, plus a one-time production cost of approximately $150. Local agencies who do not wish to participate in the TAB program, can pay the one time production cost for a localized spot that they can provide their local access channel and cable system.

Under the new TDEC partnership, the local agency investment in the TAB will be leveraged by matching grants from TDEC. For placement of ads which are solely devoted to automotive products, TDEC will match the local investment by 100%. For placement of mixed ads, TDEC will match the local investment by 33%.

Example:
Local agency buy-in at $2,000 per year. During two quarters, the ads are devoted solely to automotive products. During the other two quarters, the "mixed" ads run.

Quarter	Local Buy-in	TDEC Match	Total TAB Buy
1st (auto only)	$500	$500	$1000
2nd (mixed)	$500	$165	$665
3rd (auto only)	$500	$500	$1000
4th (mixed)	$500	$165	$665
Totals	**$2000.00**	**$1330.00**	**$3330.00**

Local Agency Benefits

- Use of high-quality radio and television announcements with local identity.
- High rate of return on dollars invested.
- Identity on the WaterWorks! website.
- Increased public awareness
- Use of media market reports to achieve complete reporting of this part of your public education and outreach programs

Water Works Agreement (Page 4)

How to Participate

The program is being administered by Bill Hudson & Associates, the advertising agency for WaterWorks.

To participate in the program, the local agency should contact Bill Hudson & Associates and provide the participation amount (how much you want to spend per quarter), agency name, telephone number and, if desired, the agency logo. The logo should be provided in either a JPEG or TIFF format. BHA will provide a letter of agreement to the local agency that should be signed and returned to BHA with an authorized purchase order.

BHA will then produce the local version of the announcements and provide copies for the local agency to use on its local cable television system and the local access channel.

Local agencies would then be invoiced by BHA for the cost of the TAB program and production costs.

BHA will provide quarterly reports to the local agencies showing the number of TV and Radio spots aired in their media market area and the value of the airplay.

The contact information at BHA is as follows:

Melissa Douso
Bill Hudson & Associates
1701 West End Avenue
Nashville, TN 37203
615-259-9002
615-256-0105 (fax)
melissa@billhudsonagency.com

Water Works Agreement (Page 5)

Summary by Media

Broadcast Television

All spots will be tagged with "A message from Tennessee broadcasters and your local stormwater management agency." The spots will promote the WaterWorks website that includes a link to contact information for local participating agencies.

NOTE: In major television markets, (Memphis, Jackson, Nashville, Chattanooga, Knoxville and Tri-Cities), we can include contact information for up to four participating local agencies in surrounding counties on the closing screen.

Cable Television

Cable television systems are not included in the TAB program. For the one-time production fee of approximately $150, we will localize the spots and distribute them to cable systems serving participating local agencies.

Local Access Television

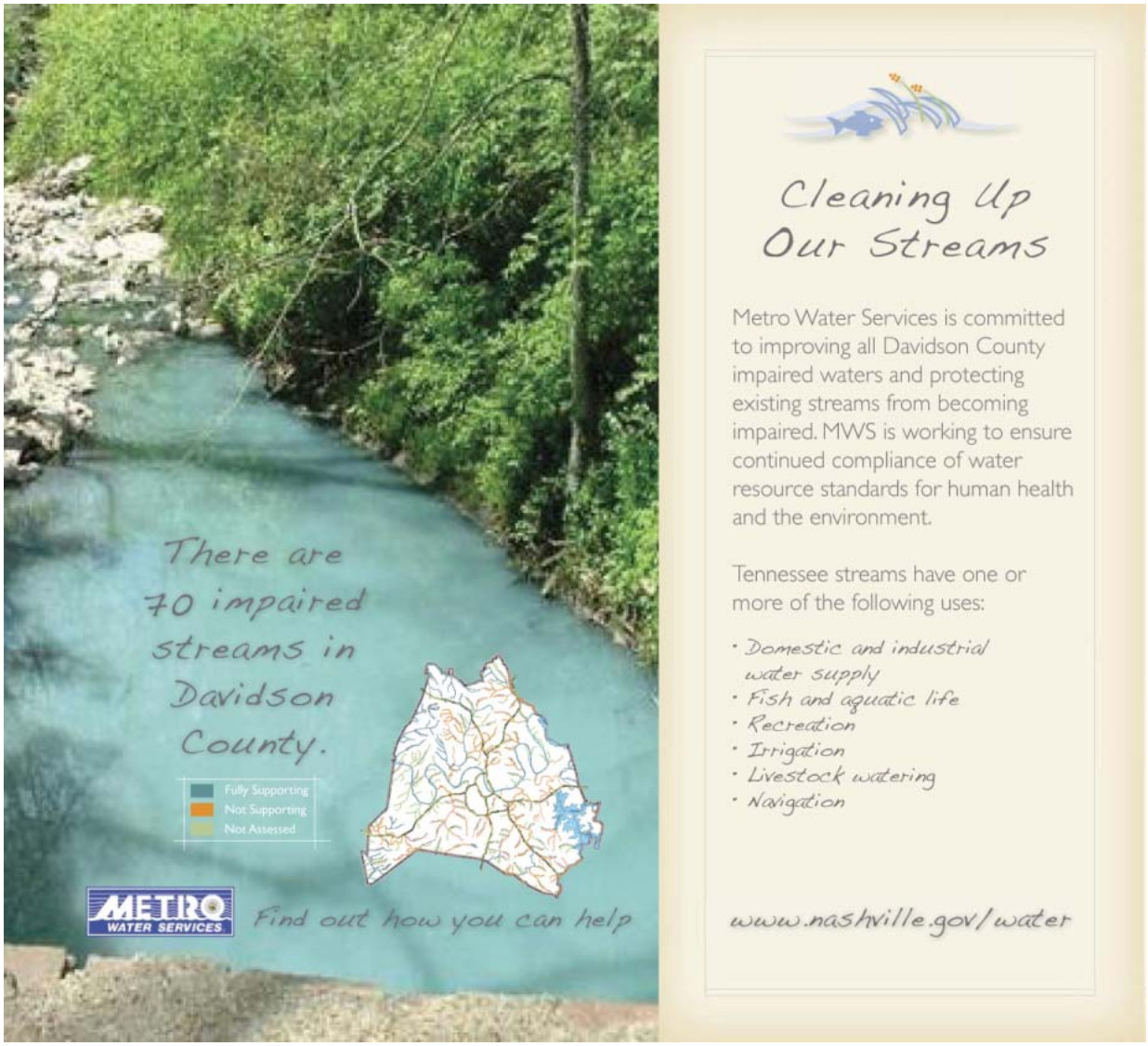
Local agencies should contact their local access cable channel to determine the format required. This information, as well as the name and telephone number of the contact at the local access channel, should be provided to BHA. BHA will then localize the ad and provide it to the local agency for delivery to the local access channel. (If requested, BHA will deliver the spots directly to the local access channel; however experience has shown that run rates are much better when spots are delivered by the local agency.)

Radio

Radio ads will have a voice tag stating "A message from Tennessee broadcasters and your local stormwater agency." BHA will provide the spots to TAB for distribution to local stations.

If requested by a local agency, BHA will provide a CD of the radio ads without a voice tag at the end. The local agency may then take this CD to local radio stations and request that the station add a tag stating, "A message from the (name of agency)." As an alternative, BHA will provide the CD directly to the local radio station (s) and request the addition of the localized.

303(d) Watershed Poster to be used at Events



Stormwater

http://www.nashville.gov/stormwater

Custom Report: 7/1/05 - 6/30/06

July 1, 2005 12:00:00 AM – June 30, 2006 11:59:59 PM

Overview Dashboard

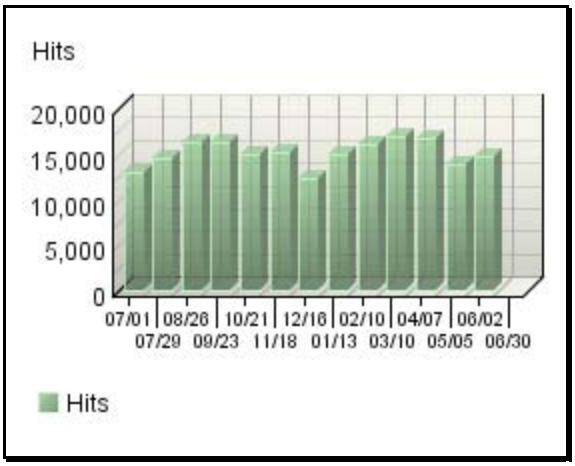
This displays key graphs and tables that provide an overview of the entire report. Click on the title of a graph or table to navigate to the corresponding page.

Visits Trend

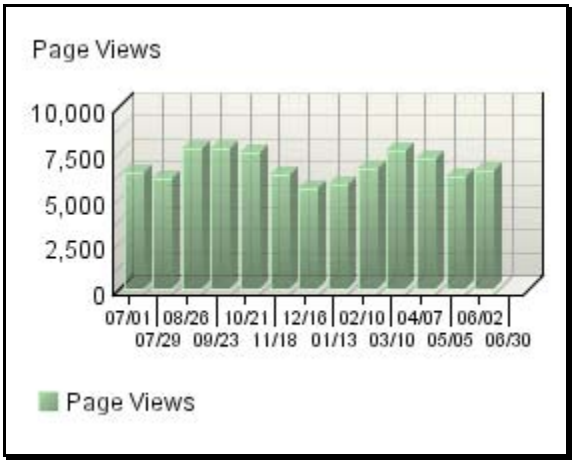
Visitor Summary	
Visitors	10,837
Visitors Who Visited Once	7,761
Visitors Who Visited More Than Once	3,076
Average Visits per Visitor	3.65

Visit Summary	
Visits	39,571
Average per Day	108
Average Visit Duration	00:03:40
Median Visit Duration	00:01:24
International Visits	0.00%
Visits of Unknown Origin	100.00%
Visits from Your Country: United States (US)	0.00%

Hits Trend



Page Views Trend



Hit Summary	
Successful Hits for Entire Site	195,591
Average Hits per Day	535
Home Page Hits	17,852

Page View Summary	
Page Views	86,904
Average per Day	238
Average Page Views per Visit	2.2

This report was generated by WebTrends 7 - Professional, Version: 7.0d, Build: 13917 .
Wednesday, October 4, 2006 1:10:18 PM
Final report conversion by WebTrends Report Exporter, Version 7.0d (build 13916)

This Page Intentionally Left Blank

Appendix C

Monitoring Program Data

Wet Weather Sampling Data from Program Conception

Incident #	Date	Watershed	Site ID	Background (pre-rain event) or Rain Event	Time	Personnel	Total Time of Event	Velocity	Rainfall	Visual Observations	Temp	pH	TSS	TDS	Tot Ammonia Nitrogen	TKN	Tot Phosphorus	Dissolved Phosphorus	Chromium	Copper	Lead	Nickel	Zinc	Fecal Coliform	BOD5	COD	Fluoride	Nitrate+Nitrite Nitrogen	Fecal Strep	Oil & Grease	Total Nitrogen	E coli	Cyanide
1	5/21/1998	Mill Creek	7-Mile	Rain Event	8:00	Phil	3	0	.1	analysis	24	7.65	15	353	0	1.9	0.43	0.34	0	0.0064	0	0	0.017	0	7.2	0		1.39	0		3.29		
2	5/21/1998	Whites Creek	Ewing	Background	9:30	Phil	3	0	.1	No bacteria samples taken		8.44	6	116	0	1.5	0.27	0.24	0	0.0046	0	0	0.0071		4.6	0		0.15			1.65		
3	8/16/1998	Mill Creek	7-mile	Background	4:00	Phil	3	0	.1	No samples were taken for fecal coliform or fecal strep (only during rain event).	26	8.6	278	300	0	1.3	1.21	0.4	0	0.0094	0.095	0	0.15		37	107		1.28			2.58		
4	8/16/1998	Mill Creek	7-mile	Rain Event	4:00	Phil	3	0	.1	Fecal coliform is actually greater than 200,000	26	8.4	54	148	0	1.2	0.25	0.23	0	0.0023	0.07	0	0.012	200000	6.4	0		0.6	46000	0	1.8		
5	10/3/1998	Mill Creek	7-mile	Background	10:30	Phil\Steve	3	0	.1	No bacteria samples taken	20	7.8	5	337	1.1	0	0.46	0.38	0	0.0057	0	0.026	0.0015		9.3	18		0.46			0.46		
6	10/3/1998	Mill Creek	7-mile	Rain Event	10:30	Phil\Steve	3	0	.1		22	7.7	53	216	0.68	1.8	0.66	0.19	0	0.01	0	0.026	0.031	37000	15	37		0.65	67000	0	2.45		
12	10/3/1998	Mill Creek	7-mile	Rain Event	10:30	Phil	3	0	.1		21	8	53	216	0.68	1.8	0.66	0.19	0	0.01	0	0.026	0.031	37000	15	37		0.65	67000		2.45		
13	10/3/1998	Mill Creek	7-mile	Background	10:30	Phil	3	0	.1		20	8.1	5	337	1.1	0	0.46	0.38	0	0.0057	0	0.026	0.0015		9.3	18		0.46			0.46		
11	10/7/1998	Richland Creek	Ewing	Rain Event	15:00	Phil\Steve	3	0	.1		18	7.8	48	335	0.41	0	0.49	0.2	0	0.0089	0.0079	0	0.025	9820	0	25		0.2	11300	0	0.2		
8	11/10/1998	Mill Creek	7-mile	Background	13:45	Phil\Steve	3	0	.1	No bacteria samples taken			5	312	0	0	0.39	0.39	0	0.0046	0.075	0.024	0.019		5.2	20		0.19			0.19		
9	11/10/1998	Mill Creek	7-mile	Rain Event	13:45	Phil\Steve	3	0	.1				43	229	0.3	1.1	0.83	0.39	0.025	0.0075	0.09	0.021	0.024	24000	9.8	29		0.4	89000	10			
10	11/10/1998	Richland Creek	Ewing	Rain Event	14:20	Phil\Steve	3	0	.1				178	373	0.3	2.2	1.33	0.26	0.025	0.0092	0.072	0.02	0.46	9360	8.4	41		0.2	16000	10			
14	1/29/1999	Mill Creek	7-mile	Background	10:00	Phil	3	0	.1	No bacteria samples taken	11	7.7	36	0	0	0	0.73	0.2	0.014	0.0058	0	0	0		0	19		1.2			1.2		
15	1/29/1999	Mill Creek	7-mile	Rain Event	10:00	Phil	3	0	.1		11	8	6	366	0	0	0.28	0.25	0.017	0.0051	0	0	0	250	0	11		1	450	0	1		
16	2/7/1999	Mill Creek	7-mile	Rain Event	7:15	Phil	3	0	.1		15	8	20	308	0	0	0.51	0.34	0.026	0.011	0	0	0.042	910	8	11	0.33	2.22	655	0	2.22		
17	2/7/1999	Mill Creek	7-mile	Background	7:15	Phil	3	0	.1	No bacteria samples taken	15	7.5	17	317	0	0	0.4	0.34	0.022	0.0066	0	0	0.006		11	0	0.33	2.32			2.32		
18	2/7/1999	Richland Creek	Sugartree	Background	7:50	Phil	3	0	.1	No bacteria samples taken	15	7.8	81	166	0	0.95	0.66	0.14	0.027	0.011	0.011	0	0.083		29	53	0.21	0.8			1.75		
19	2/7/1999	Richland Creek	Sugartree	Rain Event	7:50	Phil	3	0	.1		15.3	7.8	64	164	0	0	0.57	0.15	0.025	0.013	0	0	0.067	3200	8	27	0.19	0.82	35000	0	0.82		
22	2/7/1999	Whites Creek	Ewing	Background	7:50	Phil		0			13.7	8.23	16	363	0	0	0.27	0.22	0.025	0.0064	0	0	0.004		3	0	0.26	0.59			0.59		
23	2/7/1999	Whites Creek	Ewing	Rain Event	7:20	Phil\Steve		0			13.7	8.2	16	395	0	0	0.3	0.3	0.022	0.0045	0	0	0.006	270	2	15	0.25	0.98	640	0	0.98		
42	3/31/1999	Richland Creek	Sugartree	Background	11:50	SW	3	0	.1				44	826	0	2.5	0.31	0.31	0	0.004	0	0.073	0.052		0	22	0.41	0.5		0	3		
43	3/31/1999	Mill Creek	7-Mile	Background	11:04	SW	3	0	.1			8.04	7	303	0	0	0.43	0.21	0	0.019	0	0.024	0.046		5	8	0.38	0.72		0	0.72		
44	3/31/1999	Mill Creek	7-Mile	Rain Event	11:04	SW	3	0	.1			7.65	114	266	0	1.6	0.89	0.34	0	0.0078	0	0.018	0.064	1590	13	32	0.34	0.68	2100	0	2.28		
45	3/31/1999	Richland Creek	Sugartree	Rain Event	11:50	SW	3	0	.1			7.32	183	254	0.2	4.5	1.02	0.28	0	0.0075	0	0.026	0.083	2400	18	68	0.37	0.59	5500	0	5.09		
46	3/31/1999	Whites Creek	Ewing	Background	12:30	SW	3	0	.1			7.97	3	346	0	0	0.24	0.24	0	0.0036	0	0	0.07		2	8	0.29	1.37		0	1.37		
47	3/31/1999	Whites Creek	Ewing	Rain Event	12:30	SW	3	0	.1			7.77	30	310	0	1.6	0.34	0.25	0	0.0049	0	0	0.056	500	6	17	0.25	0.29	1545	6	1.89		
21	9/29/1999	Mill Creek	7-Mile	Rain Event	10:05	Mike/Sonia	3	0	.1				62	279	0	0.63	1.13	0.44	0	0.018	0	0	0.037	85000	0	26	0.49	0.37	14000	0			
24	9/29/1999	Richland Creek	Sugartree	Rain Event	11:20	Steve	3	0	.1		21.8	7.4	341	78	0.42	7.44	3.86	0.82	0	0.039	0	0	0.21	28000	12	164	0.19	0.781	19000	0			
26	9/29/1999	Richland Creek	Sugartree	Background	10:15	S.Wall	3	0			21.8	7.4	413	73	0.42	3.68	2.7	0.69	0	0.099	0	0.1	0.33		16	94	0.18	0.713		0	1.133		

Wet Weather Data (Continued)

Incident #	Date	Watershed	Site ID	Background (pre-rain event) or Rain Event	Time	Personnel	Total Time of Event	Velocity	Rainfall	Visual Observations	Temp	pH	TSS	TDS	Tot Ammonia Nitrogen	TKN	Tot Phosphorus	Dissolved Phosphorus	Chromium	Copper	Lead	Nickel	Zinc	Fecal Coliform	BOD5	COD	Fluoride	Nitrate+Nitrite Nitrogen	Fecal Strep	Oil & Grease	Total Nitrogen	E coli	Cyanide
27	9/29/1999	Mill Creek	7-Mile	Background	10:05	Mike/Sonia	3	0	.1				16	290	0	0	0.49	0.49	0	0.015	0	0	0.012		0	13	0.5	0.4		0			
28	2/17/2000	Mill Creek	7-Mile	Background	10:30	Phil\MikeS	3	210	210	388,860 cf	10.1	7.9	7	313	0	1.07	0.66	0	0	0	0	0	0	310	0	0	0.48	2.05	175	0	3.12		
29	2/17/2000	Mill Creek	7-Mile	Rain Event	10:30	Phil\MikeS	3	210	210	388,860 cf	10.4	8	1	320	0	1.33	1.17	0	0.01	0	0	0	0	310	0	0	0.46	1.96	175	0	3.29		
30	2/17/2000	Richland Creek	Sugartree	Background	11:15	Phil\MikeS	3	0	.1	64,000 cf	9.4	7.9	1	310	0	1.2	0.94	0	0	0	0	0	0.008	1250	0	13	0.58	1.6	240	0	2.8		
31	2/17/2000	Richland Creek	Sugartree	Rain Event	11:15	Phil\MikeS	3	0	.1	64,000 cf	9.2	7.5	76	172	0	1.33	0.29	0.12	0	0	0	0	0.026	1250	5	17	0.31	1.264	240	0	2.59		
32	2/17/2000	Whites Creek	Ewing	Background	10:50	Phil\MikeS	3	30	.33	93,000 cf	8.9	8.1	34	410	0	1.33	1.03	0.92	0	0	0	0	0	1140	0	22	0.37	1.39	220	6	2.72		
33	2/17/2000	Whites Creek	Ewing	Rain Event	10:50	Phil\MikeS	3	30	.33	93,000 cf	9	8	9	371	0	1.2	0	0	0	0	0	0	0.007	1140	5	11	0.34	1.6	220	6	2.8		
34	4/11/2000	Whites Creek	Ewing	Background	5:30	PS	3	0	.1		15	7.9	12	370	0	0	0.45	0.24	0	0.012	0	0	0.034	5800	13	27	0.33	0.21	23000	0	0.21		
35	4/11/2000	Whites Creek	Ewing	Rain Event	5:30	PS	3	0			15	7.9	23	491	0	0	0.73	0.26	0	0.011	0	0.013	0.047	5800	5	64	0.29	0.29	23000	0	0.29		
36	4/11/2000	Richland Creek	Sugartree	Background	6:10	PS	3	0	.1		15.8	7.7	8	352	0	0	1.55	0.49	0	0.011	0	0	0.029	3300	8	32	0.53	0.54	4800	0	0.54		
37	4/11/2000	Richland Creek	Sugartree	Rain Event	6:10	PS	3	0	.1		16.8	7.9	19	324	0	0	1.03	0.26	0	0.014	0	0	0.046	3300	4	46	0.31	0.572	4800	0	0.572		
38	4/11/2000	Mill Creek	7-Mile	Background	7:10	PS	3	0	.1		15.2	7.4	2	253	0	0	0.98	0.41	0	0	0	0	0.017	4500	3	44	0.42	0.88	6200	0	0.898		
39	4/11/2000	Mill Creek	7-Mile	Rain Event	7:10	PS	3	0	.1		15.8	7.8	70	377	0	1.24	1.07	0.29	0	0.013	0	0	0.041	4500	7	26	0.33	0.908	6200	0	2.148		
40	11/6/2000	Richland Creek	Sugartree	Background	13:45	PS	3	0			17.1	7.8	60	154	0	1.43	1.67	0.69	0	0.045	0.056	0.012	0.14	40000	22	82	0.28	1.27	14000	0	2.7		
41	11/6/2000	Richland Creek	Sugartree	Rain Event	13:45	PS	3	0			17.3	7.9	32	185	0.46	0	1	1	0	0.042	0.011	0.017	0.098		10	77	0.27	1.44			1.44		
48	1/29/2001	Whites Creek	Ewing	Background	20:00	PS	3	0	.1		9.3	8	20	438	1.2	1.2	0.52	0.31	0	0.015	0	0	0	60	0	0	0.32	1.03	350	0	2.23		
49	1/29/2001	Whites Creek	Ewing	Rain Event	20:00	PS	3	0	.1		9.6	7.9	12	386	0.47	0	0.47	0.28	0	0.016	0	0	0.008		3	0	0.29	1.34		0	1.34		
50	1/29/2001	Richland Creek	Sugartree	Background	20:45	PS	3	0	.1		11.1	8	57	325	0.61	0	0.76	0.44	0	0.017	0	0.011	0.019	3800	4	0	0.41	1.34	9000	0	1.34		
51	1/29/2001	Richland Creek	Sugartree	Rain Event	20:45	PS	3	0	.1		11.2	8	45	345	0.67	1.01	0.65	0.47	0	0.021	0	0	0.036		7	30	0.36	1.502		0	2.512		
52	4/24/2001	Whites Creek	Ewing	Background	12:11	Phil Saad	3	0			20	8	0.076	353	0	1.21	0.17	0.076	0	0.013	0	0	0	16500	0	0	0.32	0.16	300	0	1.37		
53	4/24/2001	Whites Creek	Ewing	Rain Event	12:11	Phil Saad	3	0			20	7.9	12	308	0	0	0.21	0.09	0	0	0	0	0.007		5	12	0	0.161		0	0.161		
55	4/24/2001	Richland Creek	Sugartree	Background	12:01	Phil Saad	3	0			20	7.4	131	360	0	0	0.9	0.4	0	0.017	0	0	0.033	266000	49	79	0.39	1.22	2800	0	1.22		
56	4/24/2001	Richland Creek	Sugartree	Rain Event	12:01	Phil Saad	3	0			20	7.6	8	248	0.4	2.08	0.32	0.32	0	0.019	0	0	0.032		16	40	0.35	0.694		0	3.174		
57	4/24/2001	Mill Creek	7-Mile	Background	13:00	Phil Saad	3	0			18	7.9	9	306	0	0	0.29	0.29	0	0.01	0	0	0	84000	7	12	0	0.652	9000	0	0.652		
58	4/24/2001	Mill Creek	7-Mile	Rain Event	13:00	Phil Saad	3	0			18	7.8	59	255	0	0.47	0.56	0.47	0	0.01	0	0	0.021		3	21	0.38	0.756		0	1.226		
59	2/26/2002	Richland Creek	Sugartree	Background	6:30	Steve Wall	3	0					84	286	0	0	0.59	0.04	0	0	0	0	0.051		6	45	0.43	0.33		0	0.33		
60	2/26/2002	Richland Creek	Sugartree	Rain Event	6:30	Steve Wall	3	0					22	243	0.35	0	0.15	0	0	0	0	0	0.036		7	19	0.36	0.515		0	0.55		
61	2/26/2002	Whites Creek	Ewing	Background	5:30	Steve Wall	3	0					3	394	0.49	0	0.02	0	0	0	0	0	0.045		6	0	0.32	2.21		0	2.21		
62	2/26/2002	Whites Creek	Ewing	Rain Event	5:30	Steve Wall	3	0					3	356	0	0	0.02	0	0	0	0	0	0.021		2	0	0.3	0.16		0	0.16		
54	3/29/2004	Richland Creek	Sugartree	Background	9:30	MS/JH	3	0	1	Ambient Data from 4/7/04 Sugartree South (upstream of wet weather site): FC=300, EC=300 Sugartree (downstream of wet weather): FC=190, EC=120			160	310	0	5.2	1.6	0.22	0	0	0	0	0.071	9100	42	110	0	0.56		0	5.8	8200	

Wet Weather Data (Continued)

Incident #	Date	Watershed	Site ID	Background (pre-rain event) or Rain Event	Time	Personnel	Total Time of Event	Velocity	Rainfall	Visual Observations	Temp	pH	TSS	TDS	Tot Ammonia Nitrogen	TKN	Tot Phosphorus	Dissolved Phosphorus	Chromium	Copper	Lead	Nickel	Zinc	Fecal Coliform	BOD5	COD	Fluoride	Nitrate+Nitrite Nitrogen	Fecal Strep	Oil & Grease	Total Nitrogen	E coli	Cyanide
63	3/29/2004	Richland Creek	Sugartree	Rain Event	9:45	MS/JH	3	0	1	Ambient Data from 4/7/04 Sugartree South (upstream of wet weather site): FC=300, EC=300 Sugartree (downstream of wet weather): FC=190, EC=120			54	130	0	1.8	0.63	0.14	0	0.012	0	0	0.056	2600	15	48	0	0.49		0	2.3	3000	
64	3/29/2004	Whites Creek	Ewing	Background	8:43	SM/PW	3	0	1				100	340	0	1.1	0.63	0.19	0	0	0	0	0.058	500	7	33	0	0.12		0	1.2	400	
65	3/29/2004	Whites Creek	Ewing	Rain Event	8:58	SM/PW	3	0	1				21	340	0	0.58	0.26	0.18	0	0	0	0	0	700	0	0	0	0		0	0.58	1300	
66	3/29/2004	Mill Creek	7-Mile	Background	8:50	RD/DB	3	0	1				4	310	0	0	0.28	0.29	0	0	0	0	0	1000	0	0	0	0.68		0	0.68	200	
67	3/29/2004	Mill Creek	7-Mile	Rain Event	9:05	RD/DB	3	0	1				86	220	0	1.7	0.79	0.31	0	0	0	0	0.074	2900	12	34	0	0.72		0	2.4	2700	
68	9/2/2004	Richland Creek	Sugartree	Rain Event		MS	3	0	1.9	Did not collect first flush *Bacteria samples analyzed past hold time E.coli: <2000			19	110	0.66	0.83	0.27	0	0	0	0	0	0.06	16000	6.6	36		0.15		0	0.98		0
69	9/2/2004	Whites Creek	Ewing	Rain Event	9:20	DB/PW	3	0	1.9	Did not collect first flush *Bacteria samples analyzed past hold time E.coli: <2000			20	400	0.37	0.74	0.25	0.12	0	0	0	0	0.12	2700	0	0	0	0		0	0.94		0
70	9/2/2004	Mill Creek	7-Mile	Rain Event	9:30	RD	3	0	1.9	Did not collect first flush *Bacteria samples analyzed past hold time			41	120	0	0.89	0.46	0.1	0	0	0	0	0.16	18000	0	29	0	0.27		0	1.2	2000	0
71	1/11/2005	Richland Creek	Sugartree	Background	8:15	MS	3	0	.6	E.coli: <2000			190	290	0.62	0.8	1.9	0.18	0.019	0	0.013	0	0.079	200	17	30		1.5		0	2.3		0
72	1/11/2005	Richland Creek	Sugartree	Rain Event	11:15	MS	3	0	.6				160	170	0.56	0.91	1.4	0	0.016	0	0.013	0	0.097	1400	0	81		0.84			1.8	2000	0
73	1/11/2005	Whites Creek	Ewing	Background	8:45	DB/PW	3	0	.6	E.coli <2000			27	380	0.34	0	0.3	0	0	0	0.01	0	0.24	100	0	43		0.94		0	0.94		0
74	1/11/2005	Whites Creek	Ewing	Rain Event	11:45	DB/PW	3	0	.6	E. coli < 2000			130	300	0.46	0.8	0.84	0.63	0.015	0	0.012	0	0.051	2100	0	26	0	0.59		0	1.4	0	0
75	1/11/2005	Mill Creek	7-Mile	Background	9:00	RD	3	0	.4	E. coli < 2000			9.6	300	0.19	0	0.41	0.36	0	0	0.0088	0	0.2	300	0	0	0	2		0	2		0
76	1/11/2005	Mill Creek	7-Mile	Rain Event	12:00	RD	3	0	.4	E. coli < 2000			21	270	0.15	0	0.29	0.24	0	0	0.0084	0	0.034	1000	0	0	0	1.9		0	1.9	0	0
77	6/30/2006	Whites Creek	Ewing	Rain Event	17:00	SW/JH	1 hr	0	.6	Fecal & E.coli > 2419			29	370	0.13	0	0.39	0.076	0	0	0	0	0.055		7.5	35	0	0.44		0	0	0	0
78	6/30/2006	Whites Creek	Ewing	Background	4:00	PW/JH	hr	0	0.6	Fecal & E.coli > 2419			45	360	0.2	0.62	0.5	0.1	0	0	0	0	0.26		7.5	46	0	0.48		0	1.1	0	0

Ambient Sampling Data

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
1	Richland Creek	Sugartree	2/4/1998	9:30	Phil\Steve		It has been raining since 09:00 on 2-3-98. The water looks more turbid.	7	7.7	0	0	0	0	0	0.036	0.11	6.5	0.9	631	3700	0	249	0.3	0.28	0	0.9	0					
2	Richland Creek	Sugartree south	2/4/1998	9:30	Phil \Steve		It has been raining since 09:00 on 2-3-98. The water looks more turbid.	7.8	7.7	0.4	0	0	0	0	0.042	0.12	15	1.04	1036	7636	0	279	0.41	0.3	0	1.44					
3	Whites Creek	Ewing	2/11/1998	10:00	Phil \ Steve	1.5	Overcast, light rain. Rained since 0700 2-10-98 periodically. 1.52 velocity	9.6	8	0	0	0	0.1	0.031	0.074	1.5	6	0.76	230	1255	0	399	0.23	0.22	0.026	0.76					
5	Whites Creek	Ewing north	2/11/1998	9:15	Phil \Steve	3.39	Overcast, light rain. Rained since 0700 on 2-10-98 periodically.3.39 velocity.	9.9	8.1	0.4	0	0	0.1	0.035	0.022	0.066	4	0.92	200	470	0	370	0.27	0.2	0.026	0.92					
4	Whites Creek	Ewing south	2/11/1998	9:15	Phil \Steve	1.8	Overcast, light rain. Rained since 0700 on 2-10-98 periodically. 1.8 velocity	10	8.2	1.4	6	0	0	0.036	0.044	0.48	180	0.84	645	3200	0	477	0.98	0.17	0.029	0.84					
8	Mill Creek	Sevenmile	2/18/1998	10:30	Phil \Steve	4.2	Rained the previous day. The water was clear.	10.6	8.1	0	1.9	0	0	0.041	0	0.038	3	1.39	280	690	0	324	0.36	0.17	0	1.39					
6	Mill Creek	Sevenmile east	2/18/1998	9:45	Phil \ Steve	4	Rained the previous day. The water was clear.	10.5	8	0	3.9	0	0	0.038	0	0.041	10	1.29	290	590	0	337	0.5	0.15	0	1.29					
7	Mill Creek	Sevenmile w.(Brentwood branch)	2/18/1998	10:00	Phil \ Steve	3.1	Rained the previous day. The water was clear.	10.6	8	0	4.7	0	0	0.038	0	0.046	6	1.38	171	300	0	337	0.3	0.14	0.021	1.38					
9	Whites Creek	Ewing	2/25/1998		Phil\Steve		Resample for metals						0		0	0.014															
10	Whites Creek	Ewing north	2/25/1998		Phil\Steve		Resample for metals						0		0	0.018															
11	Whites Creek	Ewing south	2/25/1998		Phil\Steve		Resample for metals						0		0	0.012															
13	Richland Creek	Sugartree	4/1/1998	10:00	Mike/Phil	0.48	Several schools of small fish present. Some algae but not as much as Sugar South. .7 3/ 10.5"/// .7/17.5"//// 0/ 14" 18.5' wide velocity 14.6 (cfs)	16.2	8.2	0	0	0	0.007	0	0.011	0.031	2	0.51	91	9	0	298	0.31	0.24	0	0.51					
12	Richland Creek	Sugatree south	4/1/1998	9:30	Mike/Phil	2.5	Recent rainfall. Water fairly clear. Stringy algae or plants visible. Snails and insects also present. 2.3/ 3.5"//// 3.8/ 5.25"/// 1.4/ 4"//// 16.5' wide velocity 15.4(cfs)	15.9	8.4	0	0	0	0.005	0	0.004	0.019	9	0.18	126	99	0	291	0.35	0.19	0	0.18					
16	Whites Creek	Ewing	4/8/1998	10:30	Phil/ Mike	1.1	Very turbid. Rained the previous night and is raining again. Width=52' 1) 1.1/ 30",2) 1.1/ 30",3) 1.1/ 36", 4) 1.1/ 48", 5) 1.1/ 48",6) 1.1/ 48" Duplicate metals ran at Spec Assays are Zinc=nd .0100 copper=nd .0100	15.1	7.8	0.9	5.7	88	0	0	0	0.014	47	0.46	3900	14500	0	245	0.85	0.29	0	1.36					
14	Whites Creek	Ewing north	4/8/1998	9:30	Phil/Mike	1.4	Very turbid. Rained the previous night and is about to start again. Width=28' 1) 0.1/ 12", 2) 1.1/ 15", 3) 3.8/ 15", 4) 1.9/ 14", 5) 0.1/ 15"	15	7.9	1.2	4	82	0	0	0	0.012	61	0.82	6500	26000	0	216	0.84	0.36	0	2.02					
15	Whites Creek	Ewing south	4/8/1998	9:45	Phil/ Mike	1.1	Relatively clear. Rained the previous night and is about to rain again. Width=25' 1) 1.3/ 10",2) 1.1/ 9", 3) 1.7/ 10", 4) 1/ 7",5) 0.1/ 8"	15.6	8.1	0.4	0	52	0	0	0	0.008	6	0.3	1010	1400	0	348	0.23	0.15	0	0.7					
17	Mill Creek	Sevenmile	4/15/1998	10:15	Phil \ Mike	2.95	Rained last night. Started to sprinkle. vel 2.95 1) .9/14" 2). 2.5/16" 3) 3.3/17" 4). 1.7/16" 5). .1/9" . 32' width	15.8	8.2	0	0	0	0	0	0	0.002	9	0.94	80	80	0	312	0.32	0.28	0	0.94					
18	Mill Creek	Sevenmile east	4/15/1998	9:00	Phil \ Mike	0.84	Rained last night. Water very clear. Aquatic life present in the form of fish & crawfish. Vel .85. 1) .1/7" 2). .9/9" 3). 1.5/11" 4). 1.7/7" 5). .01/3" Width 18'	15.5	8.2	0	0	0	0	0	0	0.002	7	0.77	20	54	0	346	0.3	0.27	0	0.77					

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
19	Mill Creek	Seven mile w.(Brentwood branch)	4/15/1998	9:00	Phil \ Mike	1.31	Rained last night. Lot of dead Crawfish. Water was very clear. Turned in samples for pesticide. Vel. 1.31 1). .2/9" 2). 1.9/15" 3). .7/17" 4) .1/15" 5)..01/11"	16.7	8.1	0	0	0	0	0	0	0.003	28	0.59	27	45	0	328	0.39	0.27	0	0.59					
20	Richland Creek	Sugartree	6/3/1998	9:15	Mike\Phil	0	No crawfish but plenty of small fish. Has not rained in at least 24 hours. .2 avg. velocity	20.4	7.3	0	0	0	0	0	0	0	0	1.02	1360	1000	0	335	0.45	0.44	0	1.02					
21	Richland Creek	Sugartree south	6/3/1998	8:30	Mike\Phil	0	Supporting crawfish, many snails. Has not rained in at least 24 hours..62 avg. vel.	23.3	7.9	0	0	0	0	0	0	0.006	6	0.29	3500	2900	0	368	0.36	0.28	0	0.29					
24	Whites Creek	Ewing	6/10/1998	9:30	Phil\Mike		Rained yesterday, no aquatic life present alive or dead	19.7	8	0	0	98	0	0	0.0041	0.064	82	0.76	3500	5000	0	341	0.47	0.37	0	0.76					
22	Whites Creek	Ewing north	6/10/1998	8:45	Phil\Mike		Rained yesterday, no aquatic life present alive or dead	24.8	7.7	0	0	0	0	0	0	0.006	10	0.88	1700	4600	0	318	0.38	0.34	0	0.88					
23	Whites Creek	Ewing south	6/10/1998	9:15	Mike\Phil		Rained yesterday, no aquatic life present alive or dead	24.4	7.7	0	0	41	0	0	0	0.004	7	0.8	3600	6300	0	461	0.43	0.36	0	0.8					
25	Mill Creek	Seven mile	6/17/1998	9:40	Phil\Steve		No rain in 48 hr., slight turbidity, many fish	19	8.2	0	0	0	0	0	0	0	8	2.04	2600	1320	0	331	0.53	0.4	0	2.04					
27	Mill Creek	Seven mile east	6/17/1998	9:30	Phil\Steve		No rain in 48 hr., slight turbidity, many fish. No crayfish	19.4	8	0	0	0	0	0	0	0.005	18	0.88	600	640	0	330	0.48	0.46	0	0.88					
26	Mill Creek	Seven mile w.(Brentwood branch)	6/17/1998	9:15	Phil\Steve		No rain in 48 hr., slight turbidity, many fish. Some crayfish	20	7.6	0	0	0	0	0	0	0	4	1.04	800	1250	0	335	0.4	0.4	0	1.04					
29	Richland Creek	Sugartree	8/5/1998	9:00	Phil\Steve	0.015	Sunny no rain in at least 72hrs. Crayfish and fish present. Area=10.3 Flow=.16cfs	22	7.5	0	32	0	0	0	0.0021	0	9.5	1	2900	2500	0	357	0.38	0.34	0	1					
28	Richland Creek	Sugatree south	8/5/1998	8:30	Phil\Steve	0.9	Sunny no rain in at least 72hrs. Crayfish present. Area=1.8 cf Flow=1.6 cfs	23	7.8	0	0	0	0	0	0.0019	0	3	0.3	5900	1950	0	407	0.22	0.22	0	0.3					
30	Whites Creek	Ewing	8/12/1998	10:20	Phil\Steve	0.08	Plenty of aquatic life. 72hrs since qualifying rain event.	25	8.3	0	0	0	0	0	0.0019	0	3	0.3	5900	1950	0	407	0.22	0.22	0	0.3					
32	Whites Creek	Ewing north	8/12/1998	10:05	Phil\Steve	0.1	Plenty of aquatic life. 72hrs since qualifying rain event.	25	8.5	1.6	0	0	0	0	0	0.002	3	0.14	2150	390	0	351	0.32	0.29	0	1.74					
31	Whites Creek	Ewing south	8/12/1998	10:00	Phil\Steve	0.5	Plenty of aquatic life. 72hrs since qualifying rain event.	24	8.5	2.9	0	0	0	0	0	0.002	10	0.13	5300	490	0	459	0.4	0.26	0	3.03					
33	Mill Creek	Seven mile	8/19/1998	10:30	Phil\Steve	0.25	Fish snails and crayfish. At least 72 hr. since a qualifying rain event	24	8.3	0	0	0	0	0	0.0022	0.011	4	0.7	20000	970	0	312	0.33	0.29	0	0.7					
35	Mill Creek	Seven mile east	8/19/1998	10:30	Phil\Steve	0.3	Plenty of fish, snakes and crayfish. At least 72 hours since a qualifying rain event	25	8.1	0	0	18	0	0	0	0.006	8	0.24	26000	1060	0	343	0.34	0.23	0	0.24					
34	Mill Creek	Seven mile w.(Brentwood branch)	8/19/1998	9:45	Phil\Steve	0.25	Plenty of fish, snakes and crayfish. At least 72 hours since a qualifying rain event	24	8.4	0	0	0	0	0	0	0.004	5	0.45	96000	3500	0	347	0.26	0.2	0	0.45					
37	Richland Creek	Sugartree	10/7/1998	9:36	Mike\Sonia	0	Raining. Oil sheen run off from neaby parking lot.	22.2	7.5	0	7.7	95	0.007	0	0.013	0.036	13	1.192	124000	47500	0.14	336	0.37	0.21	0	1.192					
36	Richland Creek	Sugatree south	10/7/1998	9:00	Mike\Sonia	0	Just started raining at time of collection. Ongoing construction at site. Erosion control measures are in place.	22.1	7.8	1.8	0	9	0	0	0.0068	0.006	9	0.36	10400	7730	0.14	443	0.21	0.16	0	2.16					
38	Whites Creek	Ewing	10/14/1998	9:35	Steve	0.1	Has not rained since 10-7-98. Plenty of aquatic life. Low flow.	14	8.1	0	8	49	0	0	0.0039	0.007	5	0.08	1171	973	0	484	0.06	0.04	0.017	0.08					
40	Whites Creek	Ewing north	10/14/1998	9:15	Steve	0.01	Has not rained since 10-7-98. Plenty of aquatic life. Low flow.	14.3	8.3	0	0	0	0	0	0.0058	0.004	2	0.03	81	90	0	431	0.02	0.02	0.016	0.03					
39	Whites Creek	Ewing south	10/14/1998	9:00	Steve	0.02	Has not rained since 10-7-98. Plenty of aquatic life. Low flow.	13.8	8.3	0	0	22	0	0	0.0033	0	3	0.03	390	300	0	517	0.13	0.08	0.013	0.03					
41	Mill Creek	Seven mile	10/21/1998	9:55	Phil\Michael	0.25	At least 72 hrs since a qualifing rain event. Some aquatic life seen.	15.1	8.4	0	0	0	0.074	0	0.0093	0.019	5	0.55	800	510	0	330	0.36	0.35	0.015	0.55					
43	Mill Creek	Seven mile east	10/21/1998	9:10	Phil\Michael	0.25	At least 72 hrs since a qualifing rain event. Plenty of aquatic life seen. An unusual amount of sediment in the bottom of the creek.	14.2	8.3	0	0	6	0.032	0	0.0027	0.005	8	0.13	360	420	0	341	0.36	0.33	0.016	0.13					

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
42	Mill Creek	Sevenmile w.(Brentwood branch)	10/21/1998	9:20	Phil\Michael	0.1	At least 72 hrs since a qualifing rain event. Plenty of aquatic life seen.	13.5	8.4	0	0	0	0.035	0	0.0063	0.012	4	0.32	110	450	0	404	0.37	0.33	0.014	0.32					
45	Richland Creek	Sugartree	12/2/1998	9:00	S.Wall	0.1	Aquatic life visible. 0.09 inches of rain 2 days prior to sampling.	14	7	0	0	4	0	0.027	0.0041	8E-04	21	0.61	236	620	0	336	0.25	0.22	0	0					
44	Richland Creek	Sugartree South	12/2/1998	8:30	S.Wall	0.1	Aquatic life present. .09 inches of rain 2 days prior to sample event.	13.2	7.2	0	0	4	0	0.025	0	0.003	3	0.09	236	620	0	447	0.23	0.14	0	0					
46	Whites Creek	Ewing	12/9/1998	10:30	S.Wall	0	Rain events 1 and 2 days prior to ambient sampling.	20.7	6.2	0	25	20	0	0.041	0.0041	0.036	10	2.75	710	4200	0	166	0.86	0.81	0	0					
48	Whites Creek	Ewing north	12/9/1998	10:15	S.Wall	1		20.4	6.7	0	0	11	0.63	0.038	0	0.011	10	2.2	790	4100	0	504	0.64	0.32	0	0					
47	Whites Creek	Ewing south	12/9/1998	10:10	S.Wall	0.5		21.3	6.8	0	7	15	0	0.036	0.0037	0.01	10	2.91	600	3700	0	41	0.49	0.45	0	0					
49	Mill Creek	Sevenmile	12/16/1998	9:25	Mike/Sonia	0				0	0	3.7	0	0.044	0.058	0	2	2.24	6200	1155	0	347	0.48	0.41	0	2.24					
50	Mill Creek	Sevenmile east	12/16/1998	8:57	Mike/Sonia	0				0	0	7.5	0	0.053	0.0036	0	3	2.46	1818	3100	0	395	0.52	0.39	0	2.46					
51	Mill Creek	Sevenmile w.(Brentwood branch)	12/16/1998	8:57	Mike/Sonia	0				0	0	8.3	0	0.044	0	0	3	2.05	330	670	0	377	0.47	0.47	0	2.05					
52	Richland Creek	Sugartree	2/3/1999	9:40	Phil\Steve	1	Some fish. Some rain in the last 72 hours but not qualifying event.	10.4	8	0	0	13	0	0	0.0045	0	5	2.78	20	54	0	336	0.34	0.3	0.021	2.78					
53	Richland Creek	Sugatree south	2/3/1999	9:05	Phil\Steve	2	Algae black conical snails,no fish. Some rain in the last 72 hours but not qualifying event.	10	8.1	0.8	0	96	0	0	0.0039	0	5	2.62	130	81	0	387	0.3	0.26	0.02	3.39					
54	Whites Creek	Ewing	2/10/1999	10:40	Phil\Steve	1.6	Plenty of fish	12.2	8.5	0	0	6	0	0.011	0.0056	0	10	0.57	72	180	0	340	0.21	0.19	0	0.57	0.26				
56	Whites Creek	Ewing north	2/10/1999	10:20	Phil\Steve	0.5	Some aquatic life	11.6	8.7	0	0	0	0	0	0	0	10	0.7	63	290	0	308	0.24	0.21	0	0.7	0.26				
55	Whites Creek	Ewing south	2/10/1999	10:15	Phil\Steve	0.75	Some aquatic life.	12.4	8.6	0	9	3	0	0.014	0.0061	0	7	0.69	370	117	0	444	0.17	0.17	0	0.69	0.34				
57	Mill Creek	Sevenmile	2/17/1999	10:10	Phil	0	Plenty of aquatic life	10.4	8.3	0	4	15	0	0.017	0.0065	0.01	55	1.85	1090	2400	0	302	0.67	0.3	0	1.85	0.31				
59	Mill Creek	Sevenmile east	2/17/1999	9:25	Phil	0	Some aquatic life	10.9	8.2	0	0	0	0	0.019	0.024	0.006	13	1.5	460	710	0	314	0.45	0.28	0	1.5	0.27				
58	Mill Creek	Sevenmile w.(Brentwood branch)	2/17/1999	9:15	Phil	0	Some aquatic life	10.8	8.2	0	3	0	0	0.017	0.0051	0	5	1.55	350	530	0	348	0.3	0.26	0	1.55	0.23				
61	Richland Creek	Sugartree	4/7/1999	10:20	Phil\Steve	1.34	Algae present		8.5	0	0	15	0	0.023	0.012	0.031	2	0.58	171	90	0.1	350	0.26	0.25	0	0.58	0.46				
60	Richland Creek	Sugatree south	4/7/1999	10:00	Phil\Steve	0.5	Very little aquatic life and lots of algee		8.1	0	1	8	0	0.019	0.015	0.036	4	0.45	90	135	0.1	378	0.26	0.25	0	0.45	0.41				
64	Whites Creek	Ewing	4/14/1999	9:20	Phil\Steve	0.16	Plenty of aquatic life	14.2	8.2	2.3	6	19	0.012	0.02	0.01	0.024	76	0.11	550	1018	0	343	0.27	0.27	0	2.43	0.3				
62	Whites Creek	Ewing north	4/14/1999	8:50	Phil\Steve	0.25	Level lower than normal.	14.4	8.2	2.3	0	13	0	0.022	0.011	0.018	0	0.13	135	320	0	372	0.21	0.17	0	2.43	0.4				
63	Whites Creek	Ewing south	4/14/1999	9:00	Phil\Steve	0.25	Level lower than normal.	14	8	2.9	3	9	0	0.02	0	0.019	1	0.4	650	630	0	491	0.18	0.15	0	3.3	0.32				
67	Mill Creek	Sevenmile	4/21/1999	9:30	Phil\Steve	0.28	Some aquatic life	15.9	8.4	0.8	0	11	0	0	0.018	0.031	9	0.93	838	480	0	308	0.52	0.36	0	1.71	0.39				
66	Mill Creek	Sevenmile east	4/21/1999	9:05	Phil\Steve	1	Some aquatic life	14.9	8.3	0	0	6	0	0	0.017	0.008	6	0.64	153	220	0	349	0.39	0.33	0.013	0.64	0.32				
65	Mill Creek	Sevenmile w.(Brentwood branch)	4/21/1999	9:00	Phil\Steve	0.3	Some aquatic life	15.6	8.1	0.8	1	8	0	0	0.018	0.009	4	1.12	613	560	0	365	0.37	0.35	0.01	1.9	0.4				
69	Richland Creek	Sugartree	6/2/1999	9:10	S.Wall	0.2		20	7.3	0.9	0	0	0	0	0.016	0.03	1	1.24	685	1036	0	300	0.47	0.49	0	2.17	0.4				
68	Richland Creek	Sugatree south	6/2/1999	8:45	S.Wall	0.2		21	7.3	4.2	0	0	0	0	0.013	0.019	5	0.47	2900	4300	0	443	0.31	0.32	0	4.67	0.45				
75	Whites Creek	ewing	6/9/1999	10:05	S.Wall	0.06		24.2	7.8	0	0	24	0	0.013	0.023	0.041	1	0.25	470	135	0	329	0.44	0.34	0	0.25	0.33				
73	Whites Creek	Ewing north	6/9/1999	9:20	S.Wall	0.1		24.1	8	0	0	13	0	0.011	0.017	0.022	1	0.16	350	390	0	320	0.31	0.31	0	0.16	0.32				
74	Whites Creek	Ewing south	6/9/1999	9:10	S.Wall	0.1		23.2	7.9	0	0	11	0	0.015	0.23	0.034	0	0.35	320	760	0	419	0.34	0.19	0	0.35	0.41				
72	Mill Creek	Sevenmile	6/16/1999	10:10	S.Wall	1		20	8	1.3	3	11	0	0	0	0.008	11	1.4	2430	2700	0	300	0.51	0.48	0	2.7	0.5				
70	Mill Creek	Sevenmile east	6/16/1999	9:15	S.Wall	0.5		20	8	1.4	0	40	0	0	0	0.009	12	0.65	1450	2500	0.37	332	0.65	0.59	0	2.05	0.37				

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
71	Mill Creek	Sevenmile w.(Brentwood branch)	6/16/1999	9:30	S.Wall	0.25		21	7.9	2.3	0	25	0	0	0.013	0.032	4	1.8	570	890	0	345	0.45	0.45	0	3.13	0.47				
77	Richland Creek	sugartree	8/4/1999	10:06	S.Wall	0.1		22.1	7.4	0	0	0	0	0	0	0.072	2	0.93	820	25	0	336	0.48	0.28	0	0.93	0.4				
76	Richland Creek	Sugatree south	8/4/1999	9:30	S.Wall	0.1		22.3	7.7	0	0	0	0	0	0	0.11	2	0.28	1190	27	0	462	0.22	0.22	0	0.28	0.49				
78	Whites Creek	ewing	8/11/1999	9:20	S.Wall	0.2		25.5	7.6	0	11	8	0	0	0	0.099	23	0.18	320	63	0	417	0.4	0.18	0.015	0.18	0.34				
79	Whites Creek	Ewing north	8/11/1999	9:00	S.Wall	0.2		24.5	7.5	0	0	0	0	0	0	0.08	18	0.1	144	153	0	445	0.65	0.22	0.013	0.1	0.33				
80	Whites Creek	Ewing south	8/11/1999	9:10	S.Wall	0.2		25	7.6	0	0	0	0	0	0	0.077	1	0.16	430	189	0	500	0.23	0.23	0.015	0.16	0.43				
81	Mill Creek	sevenmile	8/18/1999	8:40	S.Wall	0.25		24.4	7.9	1.4	0	13	0	0	0	0.07	4	0.57	829	350	0	304	0.38	0.31	0	2.01	0.61				
83	Mill Creek	Sevenmile east	8/18/1999	8:10	S.Wall	0.25		23.2	7.9	0.9	0	0	0	0	0	0.049	5	0.21	230	420	0	360	0.81	0.71	0.015	1.14	0.41				
82	Mill Creek	Sevenmile w.(Brentwood branch)	8/18/1999	8:00	S.Wall	0.25		22.8	7.7	0	0	0	0	0	0	0.052	9	0.25	964	340	0	403	0.46	0.43	0	0.25	0.47				
85	Richland Creek	Sugartree	10/6/1999	8:45	S.Wall	0.1		15.5	7.1	0	0	19	0	0	0	0.008	3	0.79	802	590	0	365	0.4	0.4	0	0.79	0.36				
84	Richland Creek	Sugatree south	10/6/1999	8:10	S.Wall	0.1	Plenty of fish.	15.5	7.6	0	0	17	0	0	0	0.006	2	0.18	1450	500	0	497	0.15	0.15	0	0.18	0.46				
88	Whites Creek	Ewing	10/13/1999	8:30	S.Wall	0	depth=18"	20.5	7.4	0	0	20	0	0	0	0	4	0.28	135	694	0	519	0.26	0.23	0	0.28	0.34				
86	Whites Creek	Ewing north	10/13/1999	8:10	S.Wall	0.3	Depth=6", plenty of aquatic life.	20.2	7.8	0	0	22	0	0	0	0.012	1	0.2	50	90	0	520	0.28	0.28	0	0.2	0.29				
87	Whites Creek	Ewing south	10/13/1999	8:20	S.Wall	0.1	depth=10"	20.2	7.8	0	0	22	0	0	0	0.011	0	0.28	210	135	0	530	0.24	0.23	0	0.28	0.41				
91	Mill Creek	Sevenmile	10/20/1999	10:50	S.Wall	0.1	Plenty of aquatic life. No rain for weeks. Depth = 8"	12.7	7.9	0.6	1	29	0	0.025	0.012	0	1	0.54	117	865	0	338	0.44	0.32	0	1.15	0.5				
89	Mill Creek	Sevenmile east	10/20/1999	10:00	S.Wall	0.5	plenty of aquatic life. No rain for weeks. Depth = 4"	10.9	7.5	0	0	29	0	0.025	0	0	0	0.22	180	91	0	383	0.37	0.36	0	0.22	0.38				
90	Mill Creek	Sevenmile w.(Brentwood branch)	10/20/1999	10:20	S.Wall	0.75	Plenty of aquatic life. No rain for weeks. Depth = 1"	10.4	7.8	0	0	34	0	0.023	0.011	0	0	0.24	27	941	0	454	0.38	0.34	0	0.24	0.44				
92	Richland Creek	Sugartree	12/1/1999	13:30	S.Wall	0	Very low flow. No significant rain for months.	13.8	5.9	0	0	19	0	0.022	0	0.016	6	1.13	9	180	0	342	0.19	0.18	0	1.13	0.37				
93	Richland Creek	Sugatree south	12/1/1999	13:10	S.Wall	0	Very low flow. No significant rain for months.	10.8	6.1	0	0	31	0	0.013	0	0	10	0.43	36	86	0.31	460	0.26	0.26	0	0.43	0.45				
94	Whites Creek	ewing	12/8/1999	9:10	S.Wall	0.01	Depth=18"	4.5	6.2	1	1	26	0	0.012	0	0	1	0.08	18	9	0.2	471	0.06	0.03	0	1.08	0.36				
95	Whites Creek	Ewing north	12/8/1999	8:30	S.Wall	0.4	Depth=8"	5.3	6.5	0.8	0	26	0	0.015	0	0	0	0.12	0	18	0.14	464	0	0	0	0.87	0.29				
96	Whites Creek	Ewing south	12/8/1999	8:45	S.Wall	0.1	Depth=8"	5.7	6.3	4.2	0	28	0	0.014	0	0	1	0.12	108	54	0.14	488	0	0	0	4.32	0.44				
97	Mill Creek	Sevenmile	12/15/1999	10:15	S.Wall	2	depth=8"	11	6.2	1.2	0	0	0	0	0.011	0.018	4	2.14	4900	700	0	378	0.75	0.34	0	3.34	0.44				
98	Mill Creek	Sevenmile east	12/15/1999	9:30	S.Wall	2	Depth=6"	11.3	5.9	0.4	0	9	0	0.01	0.013	0	3	1.53	54	117	0	428	1.5	0.94	0	1.94	0.83				
99	Mill Creek	Sevenmile w.(Brentwood branch)	12/15/1999	9:45	S.Wall	2	depth=4"	10.6	5.8	0.8	0	11	0	0	0.012	0	0	1.57	45	360	0	397	0.78	0.35	0	2.32	0.45				
101	Richland Creek	Sugartree	2/2/2000	10:00	Steve	0	depth=8"	6.9	6	0.8	0	0	0	0	0	0	14	1.15	117	117	0	358	0.3	0.24	0	1.94	0.45				
100	Richland Creek	Sugatree south	2/2/2000	9:30	Steve	0.1	depth=4"	4.6	6.3	0	0	0	0	0	0	0	12	0.84	36	14	0.34	502	0.16	0.095	0	0.84	0.4				
102	Whites Creek	Ewing north	2/9/2000	8:45	Steve	1	depth=6"	4.6	6.5	0.9	0	8	0	0	0	0	0	0.3	0	0	0	423	0.14	0.14	0	1.22	0.31				
103	Whites Creek	Ewing south	2/9/2000	8:55	Steve	0.5	depth=6"	4.8	6.4	0	3	0	0	0	0	0	0	0.36	250	9	0	515	0.42	0.13	0.01	0.36	0.45				
104	Mill Creek	Sevenmile	2/16/2000	10:00	SW/PS	2.5	depth-24"	11.7	6.4	0	0	4	0	0	0	0.005	37	2.38	460	99	0	343	1.12	0.52	0.014	2.38	0.42				
105	Mill Creek	Sevenmile east	2/16/2000	9:20	PS/SW	2.5	depth-12"	11.6	6.1	0.5	0	0	0	0	0	0.007	10	2.11	72	108	0	377	0.5	0.42	0.013	2.63	0.35				
106	Mill Creek	Sevenmile w.(Brentwood branch)	2/16/2000	9:30	SW/PS	1.3	depth-8"	11.1	6.3	0	0	0	0	0	0	0	2	2.63	144	99	0	393	0.3	0.028	0	2.63	0.46				
107	Richland Creek	Sugartree	4/5/2000	10:30	PS/SW	0.5	depth 12" lots of aquatic life	12.2	8	0	0	22	0	0	0.014	0.034	1	1.09	171	189	0	326	0.56	0.44	0	1.09	0.47				
108	Richland Creek	Sugatree south	4/5/2000	10:05	SW/PS	1	depth-6" snails and algea	12.5	7.8	0	0	20	0	0	0.016	0.023	2	0.52	144	180	0	397	0.52	0.46	0	0.52	0.38				

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
109	Whites Creek	Ewing	4/12/2000	9:50	MS/SB	0	depth-	12.5	7.9	1.4	3	22	0	0.13	0	0.017	12	0.84	1333	2500	0	352	1.59	0.38	0	2.14	0.35				
111	Whites Creek	Ewing north	4/12/2000	10:10	MS/SB	0	depth	12.7	7.8	1.2	3	15	0	0.017	0	0.019	9	0.77	3800	2500	0	173	1.39	0.39	0	1.93	0.33				
110	Whites Creek	Ewing south	4/12/2000	10:05	MS/SB	0	depth-	13.3	7.9	0	1	59	0	0.015	0	0.011	8	0.74	530	1360	0	293	0.67	0.56	0	0.74	0.4				
113	Mill Creek	Sevenmile	4/19/2000	9:20	MS/SH	0		13.8	8	0	0	20	0	0	0.016	0.022	9	1.84	856	545	0	304	0.69	0.66	0.012	1.84	0.38				
114	Mill Creek	Sevenmile east	4/19/2000	8:50	SH/MS	0	sediment present	13.6	8	0	0	9	0	0	0.015	0.015	2	1.42	2000	727	0	325	0.82	0.32	0.013	1.42	0.41				
112	Mill Creek	Sevenmile w.(Brentwood branch)	4/19/2000	8:55	MS/SB	0	sediment present	13.4	7.9	0	0	6	0	0	0.015	0.018	1	1.652	2200	1820	0	327	0.96	0.52	0.014	1.652	0.33				
115	Richland Creek	Sugartree	6/7/2000	10:30	PS\SW	1	depth 12" at column saw fish	17.8	7.7	0	0	13	0	0	0	0.011	0	2.4	698	620	0	348	0.35	0.35	0	2.4	0.38				
116	Richland Creek	Sugatree south	6/7/2000	10:10	PS\SW	0.25	depth 1" saw fish algea and snails	18	8.1	0	0	0	0	0	0	0.011	2	0.53	1270	1520	0.39	435	0.24	0.24	0	0.53	0.43				
117	Whites Creek	Ewing	6/14/2000	10:40	PS &SW	0.08	depth-1.5'	25.7	7.8	0	0	15	0	0	0	0.03	4	0.32	2360	30000	0	411	0.3	0.24	0	0.32	0.36				
119	Whites Creek	Ewing north	6/14/2000	10:15	PS &SW	0.1	depth-9"	24.8	8.3	0	1	24	0	0	0	0.015	0	0.16	2600	380	0	430	0.22	0.2	0	0.16	0.47				
118	Whites Creek	Ewing south	6/14/2000	10:20	PS &SW	0.1	depth-4"	25.4	8.3	0	0	0	0	0	0	0.031	0	0.2	1110	200	0	391	0.36	0.3	0	0.2	0.34				
120	Mill Creek	Sevenmile	6/21/2000	10:40	PS &MS	1	1.5'	26.3	8.1	1.2	0	199	0	0.011	0	0.027	12	0.91	1910	440	0	323	18	0.4	0	2.15	0.46				
121	Mill Creek	Sevenmile east	6/21/2000	10:15	MS &PS	1	12"	25	8.1	0	0	26	0	0.011	0	0.013	4	0.62	5800	1410	0	344	0.4	0.36	0	0.62	0.38				
122	Mill Creek	Sevenmile w.(Brentwood branch)	6/21/2000	10:00	PS &MS	1	depth-2"	25.2	8.1	0	0	29	0	0	0	0.009	4	0.89	5910	2300	0	409	0.43	0.41	0	0.89	0.46				
123	Richland Creek	Sugartree	8/2/2000	10:00	PS	0.1	depth 12"	24	7.4	0	2	0	0	0.035	0.032	0.091	4	1.38	5350	2750	0	359	0.59	0.18	0	1.38	0.43				
124	Richland Creek	Sugatree south	8/2/2000	9:40	PS	0.1	depth-2"	24	7.9	0	1	7	0	0	0	0.007	8	0.36	2200	2900	0	542	0.28	0.18	0	0.36	0.53				
127	Whites Creek	Ewing	8/9/2000	10:15	PS SW	0.1	plenty of fish	26.4	7.6	0	2	35	0.005	0	0	0.037	5	0.17	1140	210	0.31	469	0.14	0	0.013	0.17	0.43				
125	Whites Creek	Ewing north	8/9/2000	9:45	PS SW	0.1	depth 12" plenty of fish & cadysfly nymph, much sediment	25.4	8	0	0	0	0	0	0	0	18	0.25	2300	270	0	481	0.96	0.52	0	0.25	0.35				
126	Whites Creek	Ewing south	8/9/2000	10:00	PS SW	0.1	depth -10" plenty of fish & cadysfly nymph, lots of snails, much sediment present	26.2	8.1	0	0	0	0	0	0	0	6	0.14	748	180	0	465	0.29	0.1	0	0.14	0.56				
128	Mill Creek	Sevenmile	8/16/2000	7:45	MS\SH	0		24.5	7.9	0	3	0	0	0.013	0.013	0	3	0.74	883	580	0	283	0.35	0.29	0.012	0.74	0.31				
130	Mill Creek	Sevenmile east	8/16/2000	8:21	MS\SH	0		24.1	7.9	0	7	0	0	0.011	0.011	0	4.3	0.15	2200	550	0	332	0.34	0.3	0.011	0.15	0.48				
129	Mill Creek	Sevenmile w.(Brentwood branch)	8/16/2000	8:25	MS\SH	0	low flow but abundance of life	23.7	8	0	7	0	0	0	0.011	0	1.3	0.55	901	560	0	400	0.31	0.3	0.012	0.55	0.51				
131	Richland Creek	Sugartree	10/4/2000	9:30	PS &SW	0.01	fish present. 1'depth	20.1	7.4	0	0	19	0	0	0	0	11	0.55	200	240	0	360	0.42	0.21	0	0.55	0.32				
132	Richland Creek	Sugatree south	10/4/2000	9:00	ps & SW	0.1	dattres and algea present. 3" depth	21.5	7.9	0	0	17	0	0	0.011	0	1.3	0.47	555	170	0	492	0.17	0.17	0	0.47	0.44				
133	Whites Creek	Ewing	10/11/2000	14:45	PS &SW	0.01	fish present. 1.6'depth	10.8	8	0	0	60	0	0	0	0	14	0.091	72	50	0	411	0.31	0.23	0	0.091	0.34				
135	Whites Creek	Ewing north	10/11/2000	14:30	PS &SW	0.01	fish present. 6"depth	13.9	8.4	0	1.5	15	0	0	0	0	7	0.023	72	130	0	436	0.26	0.18	0	0.023	0.23				
134	Whites Creek	Ewing south	10/11/2000	14:35	PS &SW	0.01	fish present. 6"depth	14.1	8.4	0	0	15	0	0	0	0	1	0.14	126	30	0	362	0.19	0.19	0	0.14	0.48				
136	Mill Creek	Sevenmile	10/18/2000	8:30	PS	0.05	fish present	16.1	7.1	0	14	0	0.02	0	0.015	0	16	0.15	420	1300	0	323	0.34	0.18	0	0.15	0.6				
137	Mill Creek	Sevenmile east	10/18/2000	9:00	PS	0.1	fish present	17.1	7.6	0	0	0	0.019	0	0.013	0	5	0.23	90	1300	0.46	408	0.36	0.32	0	0.23	0.48				
138	Mill Creek	Sevenmile w.(Brentwood branch)	10/18/2000	9:05	PS	0.01	fish present	16.2	7.5	0	2	0	0.012	0	0.015	0	4	0.45	440	5000	0	455	0.34	0.34	0	0.45	0.49				
139	Richland Creek	Sugartree	12/6/2000	12:15	PS	0.01	some fish, no rain in at least 72hrs, 1'depth, ecoli-300,enterococcus-<10	9.6	7.2	0	270	0	0	0.01	0	0	20	1.28	160	270	0	328	0.95	0.57	0	1.28	0.42				
140	Richland Creek	Sugatree south	12/6/2000	12:35	PS	0.1	6" depth no rain in at least 72hrs, snails & algae, ecoli-850, enterococcus-<10	7.7	7.7	2.9	0	0	0	0	0	0	9	0.78	220	140	0	523	0.42	0.23	0	3.76	0.45				

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
141	Whites Creek	Ewing	12/13/2000	9:42	SW/PS	0.01	very cold, depth 1.67', e-coli-50, enterococcus-310	2.3	7.8	0	0	20	0	0	0	0	3	0.05	100	70	0.4	445	0.14	0.14	0	0.05	0.36				
142	Whites Creek	Ewing north	12/13/2000	9:42	SW/PS	0.2	very cold, depth 1', e-coli-800, enterococcus-<10	2.5	8	3.9	0	27	0	0	0	0	2	0.06	340	80	0	458	0.15	0.15	0	3.96	0.3				
143	Whites Creek	Ewing south	12/13/2000	9:42	SW/PS	0.2	very cold, depth 1', e-coli-1700, enterococcus-<10	3.4	7.9	0	0	24	0	0	0	0	1	0.21	290	700	0	505	0.11	0.11	0	0.21	0.46				
144	Mill Creek	Sevenmile	12/20/2000	9:40	SW/MS	1.2	16" depth, ecoli-300, enterococcus-260	5.1	7.7	0	0	41	0	0	0	0	1	2.72	370	1100	0	367	0.38	0.34	0	2.72	0.42				
145	Mill Creek	Sevenmile east	12/20/2000	9:10	SW/MS	4	16" depth, ecoli-800,enterococcus-9	5.8	7.7	0	0	24	0	0	0	0	3	3.1	45	300	0	376	0.36	0.3	0	3.1	0.35				
146	Mill Creek	Sevenmile w.(Brentwood branch)	12/20/2000	9:20	SW/PS	2	16" depth, ecoli-500,enterococcus-54	4.3	7.7	0	0	6	0	0	0	0	1	3.03	90	800	0	418	0.34	0.32	0	3.03	0.43				
147	Richland Creek	Sugartree	2/7/2001	11:40	PS	0.01	Some fish, no algea present	11.2	7.7	0	0	0	0	0	0	0	0	2.36	0	110	0.54	360	0.25	0.23	0	2.36	0.4				
148	Richland Creek	Sugatree south	2/7/2001	11:20	PS	1	Lots of brown algea, some fish	10.9	8.1	0	0	0	0	0	0	0	0	1.65	140	700	0.34	474	0.29	0.24	0	1.65	0.42				
151	Whites Creek	Ewing	2/14/2001	9:35	PS/MS/SH	0.4	72 hrs of rain , muddy, no visability, no rain at the time of sampling	12.1	7.3	2.1	3	49	0	0.02	0.011	0.039	362	0.65	6760	90000	0.54	416	2.51	0.45	0.013	2.73	0.26				
149	Whites Creek	Ewing north	2/14/2001	9:51	PS/MS/SH	1	72 hrs of rain , muddy, no visability, no rain at the time of sampling	11.7	7.8	0	0	0	0	0.018	0	0.014	65	0.85	3100	5000	0.47	370	0.85	0.18	0	0.85	0.26				
150	Whites Creek	Ewing south	2/14/2001	9:56	PS/MS/SH	3	72 hrs of rain , muddy, no visability, no rain at the time of sampling	11.9	7.9	1.2	3	20	0	0.022	0.014	0.057	213	1	3300	130000	0.4	340	2.01	0.51	0.017	2.21	0.3				
152	Mill Creek	Sevenmile	2/21/2001	9:45	PS	3	clear, fish present	11	8.3	0	5	0	0	0	0	0	6	2.69	310	1700	0.34	320	0.24	0.13	0	2.69	0.37				
153	Mill Creek	Sevenmile east	2/21/2001	10:45	PS	3	clear, fish present	11	8.1	0	0	0	0	0.01	0	0	10	2.65	117	240	0	340	0.25	0.15	0	2.65	0.31				
154	Mill Creek	Sevenmile w.(Brentwood branch)	2/21/2001	10:30	PS	3.5	clear, fish present & some algae	11	8.2	0	0	0	0	0	0	0	5	2.75	144	300	0	359	0.28	0.13	0	2.75	0.38				
155	Richland Creek	Sugartree	4/3/2001	9:50	PS	0.2		14.1	8	0	3	8	0	0	0	0	3	0.482	19	23	0	335	0.42	0.3	0	0.482	0.42				
156	Richland Creek	Sugatree south	4/3/2001	9:30	PS	1		13.6	7.9	0	12	0	0	0	0	0	2	1.031	130	170	0.47	446	0.45	0	0	1.031	0.39				
157	Whites Creek	Ewing	4/10/2001	11:30	ps	0.1	lots of brown/green algae, plenty of fish no rain in >72 hrs	22	7.5	0	4	17	0	0	0	0	9	0.11	50	80	0.54	365	0.8	0	0	0.11	0.31				
159	Whites Creek	Ewing north	4/10/2001	11:59		0.2	lots of brown/green algae, plenty of fish no rain in >72 hrs	22	7.9	0	0	12	0	0	0	0	1	0.057	18	170	0	341	0.62	0.15	0	0.057	0.3				
158	Whites Creek	Ewing south	4/10/2001	11:45	PS	0.2	lots of brown/green algae, plenty of fish no rain in >72 hrs	22	8	0	3	34	0	0	0	0	0	0.11	150	110	0	490	0.61	0.053	0	0.11	0.4				
160	Mill Creek	Sevenmile	4/17/2001	11:00	PS	3	some fish not much other aquatic life, sediment	12.5	8.1	0	6	15	0	0.011	0.012	0.038	44	1.46	840	350	0	321	1.37	0	0	1.46	0.43				
161	Mill Creek	Sevenmile east	4/17/2001	11:40	PS	2	some fish not much other aquatic life, sediment	12.7	8	1	0	0	0	0	0.015	0	2	1.04	540	220	0	342	0.67	0.02	0	1.04	0.35				
162	Mill Creek	Sevenmile w.(Brentwood branch)	4/17/2001	11:50	PS	2	some fish not much other aquatic life, sediment	12	8	0	0	8	0	0.011	0.013	0	2	1.56	820	280	0	349	0.63	0.32	0	1.56	0.43				
164	Richland Creek	Sugartree	6/6/2001	10:35	SW	0.1		19.6	7.3	0	0	0	0	0	0.012	0	3	1.68	354	1600	0.34	334	0.4	0.33	0	1.68	0.43				
163	Richland Creek	Sugatree south	6/6/2001	10:10	SW	0.2		20.8	7.7	0	0	0	0	0	0	0	2	1.2	5800	1600	0.47	443	0.25	0.12	0	1.2	0.47				
167	Whites Creek	Ewing	6/13/2001	9:20		1		22.8	7.7	0	0	7	0	0	0	0	15	0.47	1020	268	0	487	0.4	0.16	0	0.47	0.36				
165	Whites Creek	Ewing north	6/13/2001	8:45	SW	0.2		22.1	7.9	0	0	4	0	0	0.011	0	5	0.49	242	237	0	422	0.32	0.2	0	0.49	0.35				
166	Whites Creek	Ewing south	6/13/2001	9:00		0.2		21.2	7.9	0	0	0	0	0	0.01	0	4	0.59	800	880	0	571	0.22	0.16	0	0.59	0.41				
171	Mill Creek	Sevenmile	6/20/2001	10:10	SW	4		23	8	0	1	19	0	0	0	0	13	1.49	1900	900	0	338	0.64	0.49	0	1.49	0.49				
168	Mill Creek	Sevenmile east	6/20/2001	9:10	SW	1		22	7.9	0	1	0	0	0	0.012	0	9	1.18	3570	1910	0	378	0.49	0.49	0	1.18	0.4				
170	Mill Creek	Sevenmile w.(Brentwood branch)	6/20/2001	9:10	SW	0.4		23	7.9	0	2	4	0	0	0	0	7	1.52	1530	1360	0	371	0.5	0.5	0	1.52	0.46				
174	Richland Creek	Sugartree	8/1/2001	11:30	Steve Wall	0		24	7.4	0	2	0	0	0	0.018	0.027	0	1.23	2000	600	0.67	368	0.54	0.43	0.028	0	0.5				
173	Richland Creek	Sugatree south	8/1/2001	11:10	Steve Wall	0		25	7.8	0	4	0	0	0	0.021	0.024	1	0.36	860	5000	0.61	528	0.27	0.27	0.026	0.36	0.57				
175	Whites Creek	Ewing	8/8/2001	9:06	MS & SH	0		26.4	8.3	0	5	0	0	0	0.015	0.026	7	0.39	1130	880	0	537	0.12	0.03	0.028	0.39	0				

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
177	Whites Creek	Ewing north	8/8/2001	9:30	MS & SH	0	9/6/01-MH sent inquiry to m asking if they had had any sewer overflows on or just before this date. RR reply-Michael, I'm not aware of any problems at this time, we do have a manhole under heavy rainfall conditi	26.4	8.3	0	6	0	0	0	0.015	0.032	38	0.5	85000	9800	0	636	0.15	0.027	0.028	0.5	0.39					
176	Whites Creek	Ewing south	8/8/2001	9:26	SH & MS	0	Suds in creek and quite a bit of sediment. 9/10/01 MS submitted a resample due to the high fecal in Ewing North. Results were 665 col/100mL fecal coliform	25.5	8.1	0	4	0	0	0	0.015	0.024	6	0.23	1180	460	0	473	0.084	0.027	0.028	0.23	0.37					
182	Mill Creek	Sevenmile	8/15/2001	11:00		0.1		22.5	8	0	0	0	0.014	0	0	0.026	5	1.59	2530	520	0	361	0.18	0.18	0	1.59	0.47					
180	Mill Creek	Sevenmile east	8/15/2001	10:30	Steve Wall	1.2		22.4	7.9	0	0	0	0.015	0	0.011	0.024	5	1.14	4100	800	0	397	0.15	0.13	0	1.14	0.4					
181	Mill Creek	Sevenmile w.(Brentwood branch)	8/15/2001	10:35	Steve wall	1		23.3	7.9	0	1	0	0.014	0	0	0.027	7	0.87	1020	580	0	328	0.2	0.2	0	0.87	0.45					
184	Richland Creek	Sugartree	10/3/2001	10:00	Steve Wall	0		16.2	7.2	0	0	0	0	0	0	0.008	5	0.42	280	411	0.54	374	0.059	0.015	0	0.42	0.41					
183	Richland Creek	Sugatree south	10/3/2001	10:00	Steve Wall	0		18.5	7.8	0	2	0	0	0	0	0.013	0	0.14	960	600	0.34	487	0.024	0	0	0.14	0.6					
187	Whites Creek	Ewing	10/10/2001	10:15	Steve Wall	0.1		14.9	8	0	1	0	0	0	0	0	6	0.48	500	143	0.34	534	0.088	0.063	0	0.48	0.39					
185	Whites Creek	Ewing north	10/10/2001	9:45	Steve Wall	0.1		14.8	8	0	0	0	0	0.01	0	0.013	1	0.388	110	240	0.34	469	0.097	0.052	0	0.388	0.34					
186	Whites Creek	Ewing south	10/10/2001	9:55	Steve Wall	0.1		15.2	8.1	0	0	0	0	0	0	0.008	3	0.23	900	480	0.34	636	0.099	0.022	0	0.23	0.45					
190	Mill Creek	Sevenmile	10/17/2001	9:40	Steve Wall	1		12.1	8.1	0	0	0	0	0	0.01	0.01	0	1.13	520	600	0	349	0.048	0.034	0	1.13	0.52					
188	Mill Creek	Sevenmile east	10/17/2001	9:30	Steve Wall	2		12	7.9	0	6	0	0	0	0.042	0.008	0	0.74	319	255	0	373	0.089	0.056	0	0.74	0.43					
189	Mill Creek	Sevenmile w.(Brentwood branch)	10/17/2001	9:40	Steve Wall	1		11.8	7.7	0	4	0	0	0	0.013	0.009	0	1.02	800	460	0	374	0.037	0.037	0	1.02	0.53					
195	Richland Creek	Sugartree	12/5/2001	10:20	Steve Wall	0.5	Dissolved Oxygen 81.2	15.6	7.4	0	0	0	0.012	0	0.023	0.04	3	1.59	105	1300	0	399	0.02	0.02	0	1.59	0.46					
194	Richland Creek	Sugatree south	12/5/2001	9:55	Steve Wall	0.5	Dissolved Oxygen 88.6	14.6	7.8	0	0	0	0.028	0	0.029	0.05	4	1.05	540	500	0	522	0.04	0.04	0	1.05	0.5					
198	Whites Creek	Ewing	12/12/2001	10:15	Steve Wall	0	Dissolved Oxygen 104.8	13.2	8.1	0	3	0	0	0	0.01	0.049	2	0.96	1170	5000	0	534	0	0	0	0.96	0.29					
196	Whites Creek	Ewing north	12/12/2001	9:40	Steve Wall	1	Dissolved Oxygen 103.7	12.8	8.1	0	0	0	0.018	0.016	0.019	0.056	3	0.77	460	900	0	451	0	0	0	0.77	0.3					
197	Whites Creek	Ewing south	12/12/2001	9:55	Steve Wall	0.5	Dissolved Oxygen 115.4	13.8	8.1	0	1	0	0.012	0	0.011	0.053	0	1.32	5300	1700	0	729	0.01	0.01	0	1.32	0.35					
193	Mill Creek	Sevenmile	12/19/2001	8:55	Steve Wall	0	Dissolved Oxygen 98.8	10.5	8.3	0	2	0	0	0	0	0.036	5	1.9	170	1300	0	356	0	0	0.012	1.9	0.38					
191	Mill Creek	Sevenmile east	12/19/2001	8:30	Steve Wall	3	Dissolved Oxygen 106.5	11.1	7.8	0	0	0	0	0	0	0.021	6	2.02	264	1400	0	387	0	0	0.012	2.02	0.3					
192	Mill Creek	Sevenmile w.(Brentwood branch)	12/19/2001	8:30	Steve Wall	2	Dissolved Oxygen 98.9	10.3	7.5	0	1	0	0	0	0	0.018	6	2.1	420	1700	0.49	384	0	0	0.01	2.59	0.41					
200	Richland Creek	Sugartree	2/6/2002	9:15	Steve Wall	0	D.O. 81.2	8.1	7.6	0	1	0	0	0	0.019	0.018	4	3.94	185	110	1.19	426	0.04	0	0.056	3.94	0.14					
199	Richland Creek	Sugatree south	2/6/2002	9:00	Steve Wall	0	D.O. 89.9	7.1	7.9	0	0	0	0	0	0.025	0.012	7	1.56	103	84	0	432	0.01	0	0.06	1.56	0.2					
203	Whites Creek	Ewing	2/13/2002	9:30	Steve Wall	0.1	D.O. 97	6.5	8.4	0	3	0	0	0	0.011	0.031	5	0.59	118	105	0	465	0	0	0.054	0.59	0.12					
201	Whites Creek	Ewing north	2/13/2002	9:00	Steve Wall	0.75	D.O. 108.8	6.8	8.3	0	1	0	0	0	0.015	0.03	2	0.42	339	110	0	411	0	0	0.052	0.42	0.13					
202	Whites Creek	Ewing south	2/13/2002	9:15	Steve Wall	0.5	D.O. 130	7.7	8.5	0	1	0	0	0	0.013	0.032	2	1.14	170	54	0	655	0	0	0.054	1.14	0.13					
204	Mill Creek	Sevenmile	2/20/2002	9:30	Steve Wall	0	D.O. 9.6	12.9	8	0	3	0	0	0	0	0.025	19	1.19	2100	1500	0	236	0.06	0.06	0.062	1.19	0.28					
205	Mill Creek	Sevenmile east	2/20/2002	9:00	Steve Wall	2	D.O. 10	11.9	7.8	0	1	0	0	0	0.012	0.027	15	1.27	520	1733	0	256	0.14	0.14	0.054	1.27	0.28					
206	Mill Creek	Sevenmile w.(Brentwood branch)	2/20/2002	9:15	Steve Wall	1	D.O. 10.8	11.9	8	0	2	0	0	0	0	0.016	169	1.07	900	840	0	319	0.08	0.08	0.06	1.07	0.34					

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
207	Richland Creek	Sugartree	4/3/2002	9:30	Sonia Harvat	0	Clear & cool, rained previous night D.O. 12.2	12.6	8.1	0	0	0	0	0.055	0.036	0	0	1.97	80	108	0	319	0	0	0.029	1.97	0.37	34			
208	Richland Creek	Sugatree south	4/3/2002	9:40	Sonia Harvat	0	Clear & cool Rained previous night D.O. 11.87	13.6	8	0	1	0	0	0.041	0.022	0	4	1.5	110	105	0	394	0	0	0.026	1.5	0.33	170			
211	Whites Creek	Ewing	4/10/2002	11:30	Steve Wall	0.13		14.9	8.5	0	6	9	0	0.027	0.016	0.036	4	0.088	57	54	0	356	0	0	0.01	0.088	0.31	22			
209	Whites Creek	Ewing north	4/10/2002	11:00	Steve Wall	1		13.9	8.6	0	0	0	0	0.04	0.026	0.045	0	0.18	125	38	0	399	0.01	0.01	0.03	0.18	0.3	80			
210	Whites Creek	Ewing south	4/10/2002	11:10	Steve Wall	0.5		16.2	8.5	0	0	5	0	0.023	0.018	0.039	1	0.23	175	88	0	594	0.07	0.07	0.018	0.23	0.37	300			
214	Mill Creek	Sevenmile	4/17/2002	13:5	Steve Wall	0.3		24.6	8.9	0	2	19	0	0	0.014	0.026	3	0.91	210	81	0	290	0.06	0	0	0.91	0.42				
212	Mill Creek	Sevenmile east	4/17/2002	1:10	Steve Wall	3		22.8	8.2	0	4	10	0	0	0.016	0.028	4	0.59	155	105	0	304	0.03	0.01	0	0.59	0.34				
213	Mill Creek	Sevenmile w.(Brentwood branch)	4/17/2002	1:20	Steve Wall	1		23.5	8.5	0	0	4	0	0	0.015	0.029	1	0.86	103	115	0	353	0	0	0	0.86	0.41				
216	Richland Creek	Sugartree	8/7/2002	10:05	SW	0.1		21.5	7.6	0	0	69	0.006	0	0.001	0.014	1	0.93	280	1300	0.06	433	0.33	0.29	0		0.4	270			
215	Richland Creek	Sugatree south	8/7/2002	9:40	SW	0.1		22.7	8.1	0	2.2	0	0.007	0	0.002	0.014	5	0.28	450	840	0.03	461	0.21	0.2	0.001		0.57	440			
219	Whites Creek	Ewing	8/14/2002	13:40	SW	0.1		28.1	8	0	2	0	0.005	0.002	0.001	0.016	13	0.08	80	140	0.03	416	0.22	0.22	0		0.36	80			
217	Whites Creek	Ewing north	8/14/2002	13:30	SW	0.1		26.2	8.5	0	0	0	0.006	0.003	0.001	0.001	9	0.13	150	760	0.02	418	0.21	0.22	0		0.35	88			
218	Whites Creek	Ewing south	8/14/2002	13:20	SW	0.1		25.9	8.4	0	0	0	0.005	0.005	0.001	0.001	16	0.09	1300	3900	0	589	0.18	0.18	0		0.43	300			
222	Mill Creek	Sevenmile	8/21/2002	11:00	SW	0.2		25.6	8	0	2	0	0.004	0.002	0.001	0.003	1	1.27	1300	870	0	353	0.32	0.31	0		0.53	540			
220	Mill Creek	Sevenmile east	8/21/2002	10:25	SW	0.4		25.4	8.1	0	0	0	0.004	0.002	0.001	0.002	3	0.38	640	720	0	388	0.4	0.4	0		0.44	640			
221	Mill Creek	Sevenmile w.(Brentwood branch)	8/21/2002	10:50	SW	0.4		25.2	8.1	0	2	0	0.004	0.002	0.001	0.007	1	0.48	870	1000	0	353	0.39	0.39	0		0.51	620			
227	Richland Creek	Sugartree	10/2/2002	9:40	SW	0.75		21	7.5		3	0	0.016	0.02	0	0.005	1	1.6	3800		0	405	0.7	0.7	0		0.38	2100			
226	Richland Creek	Sugatree south	10/2/2002	9:20	SW	1		22.6	7.8		4	0	0.018	0.003	0	0.017	4	0.2	2600		0	447	0.6	0.6	0		0.44	2200			
230	Whites Creek	Ewing	10/9/2002	9:30	SW	0		18.2	8.1		0	0	0.023	0.012	0	0.006	6	0.17	310	320	0	529	0.6	0.6	0.0005		0.34	260			
228	Whites Creek	Ewing north	10/9/2002	9:00				18.4	8.1		0	0	0.02	0.004	0	0.002	2	0.2	40	240	0	469	0.6	0.6	0		0.34	20			
229	Whites Creek	Ewing south	10/9/2002	9:10		0		18.2	8.2		0	0	0.026	0.008	0	0.008	2	0.49	450	860	0	665	0.5	0.5	0		0.4	300			
225	Mill Creek	Sevenmile	10/16/2002	9:10	SW	0.8		14.2	8	0	3	5	0.007	0	0.005	0.001	14	1.6	54	590	0	309	1	1	0		0.45	37			
223	Mill Creek	Sevenmile east	10/16/2002	8:30	SW	3		15.6	8.1	0	0	11	0.006	0	0.006	0.01	6	1.4	51	620	0.02	370	1	1	0		0.42	37			
224	Mill Creek	Sevenmile w.(Brentwood branch)	10/16/2002	8:40	SW	2		15.2	8.1	0	2	9	0.007	0	0.007	0.011	1	1.7	33	730	0.02	380	1	1	0		0.35	24			
232	Richland Creek	Sugartree	12/4/2002	11:10	SW	0					6		0.001	0	0.006	0.009	14	0.51	2000	6300		127	0.9	0.9	0		0.18	1700			
231	Richland Creek	Sugatree south	12/4/2002	10:50	SW	0					5		0.007	0	0.01	0.016	28	0.4	5000	18000		198	0.9	0.9	0.0012		0.23	4200			
233	Whites Creek	Ewing	12/11/2002	9:35	SM/RD/MS	0		8.3	7.6		3		0.013	0.002	0.002	0.012	17	0.77	1500	5700		310	1.2	1.1	0		0.29	1300			
235	Whites Creek	Ewing north	12/11/2002	10:05	SM/RD/MS	0		8.1	7.7		3		0.018	0.003	0.005	0.009	10	0.89	4500	7500		285	1.3	1.2	0		0.29	3800			
236	Mill Creek	Sevenmile	12/19/2002	8:55	SM	0		13	7.8		0		0.011	0	0.01	0.013	3	1.7	310	390		346	0.9	0.9	0		0.39	300			
238	Mill Creek	Sevenmile east	12/19/2002	10:05	SM	0		12.06	8		0		0.013	0	0.013	0.015	4	1.6	45	310		377	0.9	0.9	0.001		0.32	45			
237	Mill Creek	Sevenmile w.(Brentwood branch)	12/19/2002	9:50	SM	0		12.6	7.9		0		0.012	0	0.011	0.013	0	1.6	1.6	130		389	0.9	0.9	0.01		0.42	95			
240	Richland Creek	Sugartree	2/5/2003	10:30	SW	0			8.2		3		0.006	0	0.001	0.012	0	1.1	45	99	0	380	0.6	0.6	0		0.41	45			
239	Richland Creek	Sugatree south	2/5/2003	10:00	SM/SW	0			8.3		4		0.011	0	0.002	0.018	7	1.2	30	100	0	415	0.6	0.6	0		0.36	20			
241	Whites Creek	Ewing	2/12/2003	10:45	SM & SW	0		7.2	8.1		2		0.015	0.004	0.004	0.022	0	0.5	55	45	0.2	494	0.6	0.6	0		0.3	45			

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
243	Whites Creek	Ewing north	2/12/2003	10:20	SM & SW	0		6.8	8.1		0		0.015	0.002	0.004	0.012	0	1.2	140	18	0	448	0.6	0.6	0		0.3	100			
242	Whites Creek	Ewing south	2/12/2003	10:30	SM & SW	0		8.2	8		2		0.022	0.005	0.004	0.018	5	0.5	110	36	0	693	0.6	0.6	0		0.38	100			
246	Mill Creek	Sevenmile	2/19/2003	11:00	SM & SW	0		11.5	7.3		0		0.009	0	0.001	0.005	1	2.9	470	180	0	310	1.1	1.1	0.0004		0.4	470			
244	Mill Creek	Sevenmile east	2/19/2003	10:20	SM & SW	0		11.1	7		0		0.007	0	0	0.01	16	2.3	90	82	0	321	1.1	1.1	0.0004		0.32	90			
245	Mill Creek	Sevenmile w.(Brentwood branch)	2/19/2003	10:30	SM & SW	0		11	7		2		0.008	0	0	0.005	3	2.3	3200	770	0	349	1	1	0.0004		0.4	3000			
250	Whites Creek	Ewing	4/9/2003	10:58	SM & VW	0		11.7	7.8		4		0.003	0.002	0	0.02	4	0.7	250	410	0	395	0.74	0.76	0		0.34	180			
251	Whites Creek	Ewing north	4/9/2003	11:14	SM & VM	0		11.7	7.8		3		0.004	0.002	0	0	3	0.8	320	490	0	384	0.8	0.8	0		0.32	270			
252	Whites Creek	Ewing south	4/9/2003	11:20	SM & VW	0		12.1	7.9		1		0.013	0.003	0	0.009	1	0.9	170	450	0	566	0.65	0.65	0		0.43	150			
248	Richland Creek	Sugartree	4/9/2003	10:20	SM & VW	0		12.5	7.7		3		0.003	0.002	0	0.023	3	1.2	150	500	0	347	0.8	0.8	0		0.41	150			
247	Richland Creek	Sugatree south	4/9/2003	10:00	SM & VW	0		12.6	7.8		4		0.009	0.002	0	0.015	4	1.4	100	140	0	388	0.7	0.7	0		0.36	100			
253	Mill Creek	Sevenmile	4/16/2003	8:29	SM & VW	0		11.5	7.3		0		0.007	0	0.001	0.001	0	1.2	240	620	0	353	1	1	0		0.4	210			
254	Mill Creek	Sevenmile east	4/16/2003	9:03	SM & VW	0		17	7.5		0		0.01	0	0.001	0.006	0	0.9	1200	630	0	361	0.9	0.9	0		0.35	1000			
255	Mill Creek	Sevenmile w.(Brentwood branch)	4/16/2003	9:10	SM & VW	0		17.3	7.7		0		0.013	0	0.004	0.002	0	1.2	140	780	0	382	1	1	0		0.42	88			
257	Richland Creek	Sugartree	6/4/2003	8:18	SM/KM/DB	0		18.8	7.2		0		0.007	0	0	0.001	0	1.1	2100	1900	0	365	0.9	0.9	0		0.44	1600			450
256	Richland Creek	Sugatree south	6/4/2003	7:55	SM/KM/DB	0		18.4	7.7		0		0.013	0	0.01	0.001	0	0.6	600	4000	0	469	0.6	0.6	0		0.47	600			530
260	Whites Creek	Ewing	6/11/2003	8:30	SM / RD	0		20.7	7.7		2		0.02	0	0.008	0.021	10	0.5	3200	8500	0	439	1	1	0		0.32	2500			412
258	Whites Creek	Ewing north	6/11/2003	8:05	SM / RD	0		20.6	7.7		0		0.014	0	0.008	0.013	1	0.5	2000	6100	0.02	351	1	1	0		0.28	1600			529
259	Whites Creek	Ewing south	6/11/2003	8:15	SM /RD	0		20.6	7.8		0		0.023	0	0.008	0.012	7	0.6	2500	8600	0.02	553	0.8	0.8	0		0.4	2300			451
261	Mill Creek	Sevenmile	6/18/2003	9:28	SM / DB	0		22.4	8		0		0	0	0	0	6	1.2	2700	2100	0.03	334	0.9	0.9	0		0.38	2400			378
263	Mill Creek	Sevenmile east	6/18/2003	10:10	SM / DB	0		22.8	7.7		0		0	0	0	0	3	1.2	360	2500	0.02	397	0.9	0.9	0		0.42	290			509
262	Mill Creek	Sevenmile w.(Brentwood branch)	6/18/2003	10:00	SM / DB	0		21.9	7.7		0		0	0	0	0	6	0.9	430	960	0.02	354	0.9	0.9	0		0.33	410			523
265	Richland Creek	Sugartree	8/6/2003	9:00	SM	0		23.3	7.3		0		0.001	0.001	0.001	0	0	0.84	820	730	0	358	0.6	0.6	0		0.72				417
264	Richland Creek	Sugatree south	8/6/2003	8:45	SM	0		24.8	7.8		0		0	0.001	0.002	0	0	0.39	820	2500	0	441	1	1	0.0008		0.53				526
268	Whites Creek	Ewing	8/13/2003	9:15	RD/SM	0		24.6	7.9		0		0.001	0.002	0	0	7	0.26	730	960	0	503	0.8	0.8	0		0.34				585
266	Whites Creek	Ewing north	8/13/2003	8:52	RD/SM	0		24.7	8		0		0.001	0	0	0	4	0.19	140	320	0	357	0.8	0.8	0		0.3				743
267	Whites Creek	Ewing south	8/13/2003	9:00	RD/SM	0		24.3	7.9		0		0.001	0.001	0	0	0	0.38	1200	2600	0	663	0.7	0.7	0.0004		0.32				486
269	Mill Creek	Sevenmile	8/20/2003	9:30	SM/DB	0		25.8	7.9		2		0.001	0.001	0.006	0.003	6	0.47	240	1100	0	524	1.1	1.1	0		0.34				579
271	Mill Creek	Sevenmile east	8/20/2003	10:10	SM/DB	0		26.4	7.9		3		0.001	0.001	0.008	0.007	4	0.63	320	500	0	388	1	1	0		0.43				432
270	Mill Creek	Sevenmile w.(Brentwood branch)	8/20/2003	9:40	SM/DB	0		25.8	7.9		2		0.001	0.002	0.012	0.005	2	0.53	300	830	0	494	1.1	1.1	0		0.47				512
272	Richland Creek	Sugartree	10/1/2003	9:15	RD/MS	0		19.4	7		0		0	0	0.005	0.006	6	1.6	1200	820	0	381	0.9	0.9	0		0.36	800			100
273	Richland Creek	Sugatree south	10/1/2003	9:30	RD/MS	0		18.2	7.4		0		0	0	0.005	0.009	0	0.46	1500	760	0	443	0.6	0.6	0		0.48	1500			100
274	Whites Creek	Ewing	10/8/2003	8:30	RD/MS	0		18.6	7.7		2		0	0	0	0	6	0.02	140	250	0	535	0.7	0.7	0		0.37	140			200
276	Whites Creek	Ewing north	10/8/2003	8:00	RD/MS	0		19.7	7.8		4		0	0	0	0	6	0.12	63	140	0	560	0.7	0.7	0		0.35	63			740
275	Whites Creek	Ewing south	10/8/2003	8:15	RD/MS	0		18.9	7.9		3		0	0	0	0	4	0.2	120	260	0	622	0.6	0.6	0		0.44	110			300
277	Mill Creek	Sevenmile	10/15/2003	8:30	RD/MS	0		15.8	7.6		0		0	0	0	0	0	0.71	1500	3500	0	313	1	1	0		0.38	1500			400

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
278	Mill Creek	Sevenmile east	10/15/2003	9:00	RD/MS	0		16.1	7.5		0		0	0	0	0	0	0.46	600	2000	0	359	1	1	0		0.36	600			410
279	Mill Creek	Sevenmile w.(Brentwood branch)	10/15/2003	9:15		0		15.8	7.6		0		0	0	0	0	0	0.6	1100	4300	0	414	1	1	0		0.43	910			460
281	Richland Creek	Sugartree	12/3/2003	9:44	RD/MS	0		13.7	7.2		0		0	0	0	0.003	0	1.42	1200	230	0	351	1	1	0		0.34	1100			
282	Whites Creek	Ewing	12/10/2003	9:30	RD/MS	0		12.6	8.3		2		0.002	0	0	0.002	26	0.38	1600	5600	0	347	1.2	1.2	0		0.28	1500			487
283	Whites Creek	Ewing north	12/10/2003	9:45	RD/MS	0		12.8	8.4		2		0.002	0	0	0.001	48	0.68	1300	6700	0	397	1.6	1.6	0		0.33	1300			460
284	Whites Creek	Ewing south	12/10/2003	10:00	RD/MS	0		12.3	8.4		2		0.002	0	0	0.002	56	0.36	2000	6500	0	416	1.4	1.4	0		0.31	2000			430
234	Whites Creek	Ewing south	12/11/2003	9:50	SM/RD/MS	0		9	7.8		3		0.012	0.002	0.003	0.021	21	0.078	540	7000		447	0.9	0.9	0		0.36	400			
287	Mill Creek	Sevenmile	12/17/2003	10:00	RD/DB	0		7.4	8.5		0		0	0	0	0.001	1	1.31	200	220	0	361	1	1	0		0.42	170	10.85		448
286	Mill Creek	Sevenmile east	12/17/2003	9:15	RD/DB	0		8.1	8.5		0		0	0	0	0.001	0	1.03	80	110	0	404	0.8	0.8	0		0.37	80	10.2		477
285	Mill Creek	Sevenmile w.(Brentwood branch)	12/17/2003	9:20	RD/DB	0		7.5	7.9		0		0	0	0.002	0.001	1	0.94	240	240	0	411	0.9	0.9	0		0.47	160	10.3		492
288	Richland Creek	Sugartree	2/4/2004	9:00	RD/PW	0		6.7	8.3		0		0.001	0	0.003	0.004	0	1.16	54	170	0	327	0.6	0.6	0		0.44	30	12.85		400
289	Richland Creek	Sugatree south	2/4/2004	9:30	RD/PW	0		6.6	9.5		0		0.001	0	0.004	0.006	1	0.82	99	500	0	365	0.6	0.6	0		0.37	0	12.6		410
292	Whites Creek	Ewing	2/11/2004	9:30	RD/PW	0		6.9	7.7		0		0	0	0.001	0.016	0	0.75	73	99	0	415	0.5	0.5	0		0.31	64	12.3		690
290	Whites Creek	Ewing north	2/11/2004	9:00	RD/PW	0		8.6	8.8		0		0	0	0.001	0.008	0	0.98	100	210	0	382	0.7	0.7	0		0.33	100	11.98		750
291	Whites Creek	Ewing south	2/11/2004	9:15	RD/PW	0		7.3	8.2		0		0	0	0.001	0.004	0	0.68	90	72	0	569	0.5	0.5	0		0.42	90	11.23		470
295	Mill Creek	Sevenmile	2/18/2004	9:15	RD/PW	0		8	8		0		0	0	0.001	0.008	4	1.4	90	54	0	340	1.1	1.1	0		0.38	90	11.64		240
293	Mill Creek	Sevenmile east	2/18/2004	8:45	RD/PW	0		8	9.3		0		0	0	0.001	0.006	1	1.3	60	110	0	340	1	1	0		0.32	30	11.31		277
294	Mill Creek	Sevenmile w.(Brentwood branch)	2/18/2004	9:00	RD/PW	0		6.5	8.8		0		0	0	0.002	0.012	0	1.4	150	77	0	381	0.7	0.7	0		0.4	150	11.92		223
296	Richland Creek	Sugartree	4/7/2004	9:45	RD	0		15.8	8		0		0	0	0	0.023	2	0.93	190	310	0.04	320	0.8	0.8	0		0.34	120	10.58		213
297	Richland Creek	Sugatree south	4/7/2004	10:00	RD	0		14.7	8.3		0		0.001	0	0.002	0	0	0.09	300	230	0.04	361	0.4	0.4	0		0.39	300	11.27		246
298	Whites Creek	Ewing	4/14/2004	9:45	RD/MS	0		9.6	8.8		0		0.001	0	0.001	0.004	4	0.71	590	1000	0	354	0.8	0.8	0		0.3	380	11.19		517
300	Whites Creek	Ewing north	4/14/2004	9:15	RD/MS	0		8.4	8.9		0		0.002	0	0	0.01	4	0.84	900	1200	0	359	0.8	0.7	0		0.84	900	11.39		293
299	Whites Creek	Ewing south	4/14/2004	9:30		0		9.6	8.5		0		0.002	0.001	0	0.006	4	0.85	1200	2100	0	526	0.7	0.7	0		0.4	900	11.72		461
302	Mill Creek	Sevenmile	4/21/2004	10:00	RD/MS	0		19.4	8		0		0	0	0	0.004	1	1.2	390	910	0.03	346	1	1	0		0.34	390	9.71		383
303	Mill Creek	Sevenmile east	4/21/2004	10:30	RD/MS	0		18.5	7.9		0		0	0	0	0.004	1	0.9	290	340	0.02	350	0.8	0.8	0		0.32	290	9.01		439
304	Mill Creek	Sevenmile w.(Brentwood branch)	4/21/2004	10:35	RD/MS	0		17	7.9		0		0	0	0	0.006	2	0.9	360	630	0.02	364	0.9	0.9	0		0.37	360	9.36		432
305	Richland Creek	Sugartree	6/2/2004	9:00	RD/PW	0		20.4	7		0		0	0	0.001	0	1	1.37	1500	2800	0	420	0.9	0.9	0	0	0.37	1500	7.23		
306	Richland Creek	Sugatree south	6/2/2004	9:15	RD/PW	0		20.6	7.6		0		0	0	0.001	0	1	0.87	1300	1700	0	420	0.9	0.9	0		0.35	1300	8.32		
307	Whites Creek	Ewing	6/9/2004	9:30	RD/JH	0		22.5	7.7		0		0	0	0.001	0.002	2	0.21	380	700	0	459	0.8	0.8	0		0.33	380	8.85		
308	Whites Creek	Ewing north	6/9/2004	9:16	RD/JH	0		22.2	7.8		0		0.003	0	0.014	0	4	0.29	1700	2100	0	456	1	1	0		0.32	1700	6.75		
309	Whites Creek	Ewing south	6/9/2004	9:09	RD/JH	0		22.3	7.8		0		0	0	0	0.002	0	0.3	540	540	0	546	0.9	0.9	0		0.44	540	7.86		
312	Mill Creek	Sevenmile	6/16/2004	9:45	RD/JH	0		23	7.9		0		0	0	0	0.003	3	1.11	820	1700	0	356	0.9	0.9	0		0.42	500	8.63		
310	Mill Creek	Sevenmile east	6/16/2004	9:15	RD/JH	0		22.6	7.6		0		0	0	0	0	6	1.05	1400	3500	0	388	0.9	0.9	0		0.35	1100	8.07		
311	Mill Creek	Sevenmile w.(Brentwood branch)	6/16/2004	9:20	RD/JH	0		22.4	7.6		0		0	0	0	0	2	1.44	700	2600	0	379	0.9	0.9	0		0.4	450	8.55		

Inc. No.	Wateshed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
313	Richland Creek	Sugartree	8/4/2004	10:15	JH/PW	0		24.7	7		0		0	0.002	0.002	0.004	4	0.55	410	4500	0.06	374	0.8	0.8	0		0.5	270	5.76	68.3	
314	Richland Creek	Sugatree south	8/4/2004	10:45	JH/PW	0		25.3	7.4		0		0.001	0	0.004	0.002	2	0.31	1300	1200	0.06	490	0.5	0.5	0		0.65	950	7	86	
315	Whites Creek	Ewing	8/11/2004	8:57	JH/MS	0		21.5	7.8		0		0	0	0	0.003	3	0.16	310	670	0	517	0.6	0.6	0		0.41	210	8.3	93.8	
316	Whites Creek	Ewing north	8/11/2004	8:40	JH/MS	0		23.2	7.8		0		0	0	0	0.004	1	0.22	140	380	0	487	0.6	0.6	0		0.38	81	8.07	94.2	
317	Whites Creek	Ewing south	8/11/2004	8:47	JH/MS	0		21.7	7.9		0		0	0	0	0.005	1	0.37	580	2500	0	551	0.5	0.5	0		0.49	450	8.85	100.8	
320	Mill Creek	Sevenmile w.(Brentwood branch)	8/14/2004	10:16	JH/DB	0		19.3	8.1		0		0	0.002	0.002	0.006	3	0.66	3800	2800	0	380	0.7	0.7	0		0.44	3800	7.7	74.6	316
318	Mill Creek	Sevenmile	8/18/2004	9:40	JH/DB	0		19.6	8		0		0	0.002	0.002	0.01	0	0.91	640	2500	0	356	0.8	0.8	0		0.47	640	8	88	240
319	Mill Creek	Sevenmile east	8/18/2004	9:15	JH/DB	0		19.6	8		0		0	0.002	0.004	0.008	1	0.66	680	2600	0	371	0.9	0.9	0		0.39	570	8.34	90.1	305
321	Richland Creek	Sugartree	10/6/2004	7:30	RD/MS	0		16.1	7		0		0.001	0	0.001	0	1	0.45	280	2700	0	487	0.8	0.8	0		0.43	250	7.93	78.6	
322	Richland Creek	Sugatree south	10/6/2004	7:45	RD/MS	0		15	7.5		0		0.001	0	0.001	0	0	0.2	2500	4700	0	381	0.5	0.5	0		0.5	2300	5.75	57	
325	Whites Creek	Ewing	10/13/2004	8:00	RD/MS	0		17.8	7.4		3		0.001	0	0.001	0.002	16	0.41	5600	13000	0	413	1	1	0		0.32	3400	5.75		
323	Whites Creek	Ewing north	10/13/2004	7:50	RD/MS	0		18.2	7.5		2		0.001	0	0.001	0.002	10	0.37	2800	8900	0	349	1.1	1.1	0		0.31	2100	8.07	85.1	
324	Whites Creek	Ewing south	10/13/2004	7:55	RD/MS	0		17.7	7.3		3		0.001	0.001	0.001	0.002	34	0.58	5400	1500	0	476	1.1	1.1	0		0.36	3400	7.45	81.5	
328	Mill Creek	Sevenmile	10/20/2004	8:56	MS/SW	0		18.7	7.6		0		0.001	0	0.001	0.004	10	2.1	1800	4100	0	356	1.4	1.4	0		0.4	1500	8.31		
326	Mill Creek	Sevenmile east	10/20/2004	8:40	MS/SW	0		18.5	7.4		0		0.001	0	0.001	0.004	16	2	2600	5600	0	367	1.6	1.6	0		0.34	1300	7.92		
327	Mill Creek	Sevenmile w.(Brentwood branch)	10/20/2004	8:43	MS/SW	0		18.5	7.5		2		0.001	0	0.002	0.002	8	2	1400	4100	0	396	1.4	1.4	0		0.41	820	8.3		
329	Richland Creek	Sugartree	12/1/2004	8:35	RD/MS	0		12	7.4		0		0	0	0.002	0.006	1	1.8	4500	3500	0	319	1	1	0		0.4	3600			
330	Richland Creek	Sugatree south	12/1/2004	8:50	RD/MS	0		11.8	7.2		0		0	0.001	0.001	0.004	3	1.4	6500	2200	0	322	1	1	0		0.38	600			
280	Richland Creek	Sugatree south	12/3/2004	9:30	RD/MS	0		11.7	7.5		0		0	0	0	0.004	0	0.58	91	210	0	464	0.6	0.6	0		0.38	73			
333	Whites Creek	Ewing	12/8/2004	8:35	RD/MS	0		11.9	7.4		2		0.001	0.001	0	0.005	13	1.1	1800	1300	0	391	1.1	1.1	0		0.29	1000			
331	Whites Creek	Ewing north	12/8/2004	8:16	RD/MS	0		14	7.7		2		0.001	0.001	0	0.005	8	1.4	6800	4200	0.02	340	1.1	1.1	0		0.29	5700			
332	Whites Creek	Ewing south	12/8/2004	8:23	RD/MS	0		13.2	7.6		0		0.002	0.001	0	0.006	6	1	700	2000	0	566	0.7	0.7	0		0.38	700			
334	Mill Creek	Sevenmile	12/15/2004	10:00	RD/PW	0	*meter broke				0		0.001	0	0	0	0	1.8	130	290	0.03	319	0.9	0.9	0		0.38	130			
335	Mill Creek	Sevenmile east	12/15/2004	9:15	RD/PW	0		8.7	8.5		0		0.001	0	0	0	6	1.6	70	140	0.03	355	1	1	0		0.33	70			
336	Mill Creek	Sevenmile w.(Brentwood branch)	12/15/2004	9:30	RD/PW	0	*meter broke				0		0.002	0	0	0	0	1.7	160	230	0.03	346	1	1	0		0.38	130			
339	Richland Creek	Sugartree	2/2/2005	9:45	DB	0		8.79	7.8		0		0	0	0	0.006	4	1	340	860	0	306	0.5	0.5	0		0.39	340			
337	Richland Creek	Sugatree south	2/2/2005	9:15	DB	0		10.9	8		0		0	0	0.001	0.014	6	0.9	1900	790	0.03	324	0.6	0.6	0		0.31	1900			
342	Whites Creek	Ewing	2/9/2005	8:15	RD/MS	0		12	8.2		2		0.001	0	0.004	0.011	3	0.5	120	130	0	400	0.6	0.6	0		0.36	100			
340	Whites Creek	Ewing north	2/9/2005	8:00	RD/MS	0		13	8.1		3		0.001	0	0.005	0.012	4	0.6	240	280	0	347	0.8	0.8	0		0.35	150			
341	Whites Creek	Ewing south	2/9/2005	8:05	RD/MS	0		11.9	7.9		3		0.001	0	0.008	0.009	2	0.6	120	160	0		0.7	0.7	0		0.43	100			
345	Mill Creek	Sevenmile	2/16/2005	9:45	RD/KM	0		12.1	8.1		0		0	0.004	0.004	0.005	3	1.18	120	41	0	311	0.9	0.9	0		0.43	110			
343	Mill Creek	Sevenmile east	2/16/2005	9:05	RD/KM	0		11.9	8		0		0.001	0.003	0.002	0.006	5	1	180	81	0	337	0.7	0.7	0		0.4	130			
344	Mill Creek	Sevenmile w.(Brentwood branch)	2/16/2005	9:15	RD/KM	0		11.8	8		0		0	0.003	0.004	0.006	2	1	150	63	0	351	0.8	0.8	0		0.45	130			
346		Sugartree	4/6/2005	8:45	RD/MS	0		14.2	7.7		0		0	0	0	0.001	1	1.2	70	150	0.03	347	0.6	0.6	0		0.41	70			
347		Sugatree south	4/6/2005	9:15	RD/MS	0		14.8	8.1		2		0	0	0	0.001	7	0.6	70	99	0	395	0.3	0.3	0		0.34	70			
350		Ewing	4/13/2005	9:00	SW	0		13.7	8.2		0		0	0	0	0.003	5	0.6	280	200	0	380	0.7	0.7	0		0.34	190			

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
348		Ewing north	4/13/2005	8:35	SW	0		13.6	8.2		0		0	0	0	0.002	3	0.8	220	230	0.02	372	0.7	0.7	0		0.42	170			
349		Ewing south	4/13/2005	8:40	SW	0		13.8	8.2		0		0	0	0	0.004	3	0.4	340	330	0	471	0.6	0.6	0		0.41	220			
353		Sevenmile	4/20/2005	9:15	RD/MS	0		15.8	8.3		0		0	0	0	0	3	0.8	2400	180	0	345	0.8	0.8	0		0.39	2300			
351		Sevenmile east	4/20/2005	8:40	RD/MS	0		15.2	8.1		0		0	0.001	0	0	3	0.8	4500	310	0	368	0.8	0.8	0		0.4	4200			
352		Sevenmile w.(Brentwood branch)	4/20/2005	8:50	RD/MS	0		15.6	8.1		0		0.001	0	0	0.001	2	0.7	2200	360	0	386	0.9	0.9	0		0.34	2200			
355	Richland Creek	Sugartree	6/1/2005	9:00	RD/MS	0		17.7	7.5		0		0	0	0.001	0.008	0	0.8	55	3000	0.03	321	0.8	0.8	0		0.37	490	4.96	54.4	459
357	Richland Creek	Sugartree	6/1/2005	9:00	RD/MS	0	Duplicate sample	17.7	7.5		0		0	0	0.001	0.006	7	0.8	440	2300	0.02	320	0.9	0.9	0		0.38	380	6.7	71.8	568
356	Richland Creek	Sugatree south	6/1/2005	9:25	RD/MS	0		18.9	7.8		0		0	0	0.002	0.006	2	0.4	3200	5800	0	440	0.6	0.6	0		0.43	2200	4.96	54.4	459
360	Whites Creek	Ewing	6/8/2005	8:30	RD/MS	0		22	7.9		0		0	0	0	0.001	4	0.3	360	390	0	439	0.7	0.7	0		0.43	220	5.23	59.5	614
358	Whites Creek	Ewing north	6/8/2005	8:15	RD/MS	0		21.7	8.1		0		0	0	0	0	4	0.5	560	3500	0.02	443	0.8	0.8	0		0.37	560	5.85	68.6	599
359	Whites Creek	Ewing south	6/8/2005	8:20	RD/MS	0		21.2	8		0		0	0	0	0.003	4	0.3	730	2100	0	445	0.7	0.7	0		0.55	690	6.59	74	607
363	Mill Creek	Sevenmile	6/15/2005	10:00	RD/MS	0		21.8	8.2		2		0	0	0	0.001	6	1.16	1500	1100	0	343	0.6	0.6	0		0.44	500	7.4	86	527
361	Mill Creek	Sevenmile east	6/15/2005	9:30	RD/MS	0		20.9	8.1		0		0	0	0	0.001	10	1	1700	2100	0.06	404	1	1	0		0.36	1400	7.55	86.3	478
362	Mill Creek	Sevenmile w.(Brentwood branch)	6/15/2005	9:40	RD?MS	0		22	8.1		0		0	0	0	0.001	7	1	1300	2300	0.04	460	0.9	0.9	0		0.45	1300	6.94	80.6	396
364	Richland Creek	Sugartree	8/3/2005	8:10	RD/MS	0		21.8	7.37		0		0	0	0.001	0	4	0.7	350	1600	0.06	387	0.9	0.9	0		0.41	150	2.7	32	487
365	Richland Creek	Sugatree south	8/3/2005	8:30	RD/MS	0		23	7.8		0		0	0	0.002	0	2	0.3	820	780	0	471	0.5	0.5	0		0.43	520	5.31	62.4	585
366	Whites Creek	Ewing north	8/10/2005	8:25	MS	0		22.8	7.1		0		0.001	0.001	0	0.003	1	0.1	30	610	0.03	570	0.6	0.6	0		0.38	10	4.52		650
367	Whites Creek	Ewing south	8/10/2005	8:30	MS	0		22.9	7.89		0		0.001	0	0	0.001	10	0.2	471	550	0.05	760	0.5	0.5	0		0.58	470	6		590
368	Whites Creek	Ewing	8/10/2005	8:40	MS	0		24.2	7.87		0		0.001	0.001	0	0.002	6	0.2	70	250	0.05	530	0.5	0.5	0		0.49	70	4.02		629
372	Mill Creek	Sevenmile	8/17/2005	8:45	RD/MS	0	Duplicate	24.3	7.96		0		0.001	0.001	0	0.002	4	0.5	560	850	0.02	359	0.8	0.8	0		0.49	550	5.05	60	526
371	Mill Creek	Sevenmile	8/17/2005	8:45	RD/MS	0		24.3	7.96		0		0.001	0	0	0.002	0	0.5	460	910	0	404	0.9	0.9	0		0.48	370	5.05	60	526
370	Mill Creek	Sevenmile w.(Brentwood branch)	8/17/2005	8:20	RD/MS	0		23.9	7.82		0		0.001	0.001	0	0.002	3	0.3	510	2600	0	527	1.1	1.1	0		0.5	300	5.1	62	662
369	Mill Creek	Sevenmile east	8/17/2005	8:15	RD/MS	0		23.7	7.76		0		0.001	0	0	0.004	5	0.4	430	2200	0.04	413	0.9	0.9	0		0.45	430	4.89	58	283
374	Richland Creek	Sugatree south	10/5/2005	9:20	RD/MS	0		20.7	7.93		0		0	0	0.001	0.002	5	0.31	200	2000	0.1	519	0.5	0.5	0		0.51	130	5.84	64.2	618
373	Richland Creek	Sugartree	10/5/2005	9:00	RD/MS	0		19.7	7.28		0		0	0	0.001	0.003	5	0.82	290	1100	0.11	442	0.8	0.8	0		0.38	220	4.3	58	569
377	Whites Creek	Ewing	10/12/2005	9:00	RD/MS	0		16	7.62		0		0	0	0	0.003	4	0.03	380	430	0	364	0.9	0.9	0		0.72	350	6.86	70	437
375	Whites Creek	Ewing north	10/12/2005	8:40	RD/MS	0		15.6	8.18		0		0	0	0	0.002	0	0.08	60	290	0	491	0.7	0.7	0		0.4	60	7.55	80	587
376	Whites Creek	Ewing south	10/12/2005	8:50	RD/MS	0		15.8	8.02		0		0	0	0	0.004	3	0.13	270	510	0	432	0.8	0.8	0		0.62	220	5.87	60	557
379	Mill Creek	Sevenmile east	10/19/2005	8:45	RD/MS	0		16.5	7.9		10		0	0	0	0.001	0	0.25	11	440	0	439	0.9	0.9	0		0.38	11	6	64	534
380	Mill Creek	Sevenmile w.(Brentwood branch)	10/19/2005	8:50	RD/MS	0		15.2	8		8		0	0	0	0.001	0	0.19	6	360	0	495	1	1	0		0.45	6	6	56	562
378	Mill Creek	Sevenmile	10/19/2005	8:25	RD/MS	0		17.3	8.03		5		0	0	0	0.001	1	0.32	8	610	0	359	0.8	0.8	0		0.46	7	6	55	465
381	Richland Creek	Sugartree	12/2/2005	8:50	RD/TM/SH	0		8.1	7.63		0		0	0	0	0	0	1.2	110	480	0.03	401	1.1	1.1	0		0.41	0	0	0	0
382	Richland Creek	Sugatree south	12/7/2005	9:05	RD/TM/SH	0		6.2	7.93		2		0	0	0	0	4	0.4	580	790	0.03	489	0.8	0.8	0		0.51	540	0	0	0
354	Richland Creek	Sugartree	12/7/2005	5:50	RD/TM/SH	0	Duplicate	8.1	7.63		0		0	0	0	0	0	1.2	140	500	0	406	1.1	1.1	0		0.41	140	7	62	390
386	Whites Creek	Ewing north	12/14/2005	10:00		0		6.9	8.12		0		0	0	0	0	2	0.33	30	63	0.04	591	0.6	0.6	0		0.46	30	8	0	455
384	Whites Creek	Ewing south	12/14/2005	9:30	SW	0		6.7	8.11		0		0	0	0	0	1	0.34	100	210	0.03	575	0.6	0.6	0		0.5	100	11	94	458
383	Whites Creek	Ewing	12/14/2005	9:00	SW	0		6.5	8.55		0		0	0	0	0	2	0.34	80	140	0.05	580	0.6	0.6	0		0.47	70	8	69	460
387	Mill Creek	Sevenmile east	12/20/2005	8:35	RD/MS	0		3.5	8.41		0		0	0	0	0	0	1.45	200	270	0	422	0.8	0.8	0		0.38	110	9	74	358

Inc. No.	Watershed	Site ID	Date	Time	Staff	Velocity	Visual Observations	Temp	pH	TKN	BOD5	COD	Lead	Nickel	Copper	Zinc	TSS	Nitrate+Nitrite Nitrogen	Fecal Coliform	Fecal Strep	Tot. Ammonia Nitrogen	TDS	Tot. Phos.	Dissolved Phos.	Chromium	Total Nitrogen	Fluoride	E coli	DO mg/L	DO %	Cond. uS
389	Mill Creek	Sevenmile	12/20/2005	9:00	RD/MS	0		2.9	8.27		0		0	0	0	0	0	1.1	45	190	0	373	0.7	0.7	0		0.47	45	10	70	334
388	Mill Creek	Sevenmile w.(Brentwood branch)	12/20/2005	8:40		0		1.9	8.07		0		0	0	0	0	0	0.71	590	140	0	416	0.7	0.7	0		0.49	590	10	72	354
172	Richland Creek	Sugartree	2/1/2006	8:05	RD/MS	0	sunny, cool	9.6	7.86		0		0	0	0.001	0	0	2.3	30	260	0	352	0.9	0.9	0		0.4	30	7	61	553
390	Richland Creek	Sugatree south	2/1/2006	8:20	RD/MS	0	sunny, cool	8.1	8		0		0	0	0	0	0	1.1	450	720	0	415	0.6	0.6	0		0.42	400	11	97	409
392	Whites Creek	Ewing south	2/8/2006	9:00	ms	0	sunny, ~40 F	7.1	8.29		0		0	0.003	0	0	9	0.6	50	45	0	524	0.6	0.6	0		0.41	40	13	103	495
391	Whites Creek	Ewing north	2/8/2006	8:55	MS	0	sunny, ~40 F	5.9	8.13		0		0	0.001	0	0	7	0.6	60	36	0	410	0.7	0.7	0		0.3	60	13	105	234
393	Whites Creek	Ewing	2/8/2006	9:15	ms	0	sunny, ~40 F	6.2	8.34		0		0	0.002	0	0	7	0.6	60	63	0	432	0.6	0.6	0		0.32	60	14	113	600
395	Mill Creek	Sevenmile w.(Brentwood branch)	2/15/2006	9:10	RD/MS	0	sunny, ~45 F	7.7	8.18		0		0	0.003	0.002	0	3	1.3	80	120	0	400	0.7	0.7	0		0.32	80	9	76	398
394	Mill Creek	Sevenmile w.(Brentwood branch)	2/15/2006	9:05	RD	0	sunny, ~45 F	8.9	7.98		3		0	0.005	0.001	0	2	0.9	70	72	0	417	0.6	0.6	0		0.44	70	10	84	401
397	Mill Creek	Sevenmile	2/15/2006	9:30	RD/MS	0	duplicate	8.9	8.32		3		0	0.002	0	0	6	1.1	1100	160	0	334	0.8	0.8	0		0.41	1000	11	96	364
396	Mill Creek	Sevenmile	2/15/2006	9:30	RD/MS	0	sunny, ~45	8.9	8.32		3		0	0.002	0	0	5	1.1	1000	220	0	362	0.7	0.7	0		0.42	900	11	96	364
398	Richland Creek	Sugartree	4/5/2006	8:45	RD/MS	0		11	7.97		0		0	0	0.002	0.004	0	1.4	15	250	0	322	0.8	0.8	0		0.37	14	10	90	509
399	Richland Creek	Sugatree south	4/5/2006	9:00	RD/MS	0	duplicate	12.4	8.03		0		0	0	0.001	0.002	3	0.8	19	250	0	367	0.8	0.8	0		0.33	18	11	107	507
400	Richland Creek	Sugatree south	4/5/2006	9:00	RD/MS	0		12.4	8.03		0		0	0	0.001	0.003	1	1.3	16	170	0	326	0.8	0.8	0		0.36	14	11	107	507
401	Whites Creek	Ewing north	4/12/2006	8:40	RD/MS	0		15.4	7.98		2		0	0.01	0	0.005	5	0.2	170	36	0	437	0.5	0.5	0		0.31	170	12	102	634
402	Whites Creek	Ewing south	4/12/2006	8:45	RD/MS	0		15.1	7.96		2		0	0	0	0.002	1	0.4	160	210	0	561	0.4	0.4	0		0.39	130	10	107	746
403	Whites Creek	Ewing	4/12/2006	8:50	RD/MS	0		15.4	7.91		2		0	0.001	0	0.002	2	0.2	190	140	0	458	0.8	0.8	0		0.32	150	11	115	665
405	Mill Creek	Sevenmile w.(Brentwood branch)	4/19/2006	8:50	RD/MS	0	overcast, 75F	18.8	7.65		0		0	0.001	0	0.003	0	0.88	100	600	0.07	415	1	1	0		0.42	110	6	69	607
406	Mill Creek	Sevenmile	4/19/2006	9:15	RD/MS	0	overcast, 75	19.3	7.83		2		0	0	0	0.004	1	0.87	280	450	0.07	339	1	1	0		0.41	260	9	100	535
404	Mill Creek	Sevenmile east	4/19/2006	8:45	RD/MS	0	overcast, ~75 F	18.3	7.43		0		0	0.002	0.0009	0.002	1	0.9	310	490	0.04	370	1.1	1.1	0		0.32	270	9	91	561
407	Richland Creek	Sugartree	6/7/2006	9:50	RD/MS	0		18.1	6.79		0		0.0066	0	0.007	0	1	1.18	340	1400	0.03	367	0.8	0.8	0.007		0.33	340	5	52	337
408	Richland Creek	Sugatree south	6/7/2006	10:10	RD/MS	0		18.7	7.41		0		0	0	0	0	13	0.53	540	1500	0	490	0.6	0.6	0.001		0.47	450	7	80	216
409	Whites Creek	Ewing north	6/14/2006	9:05	RD/SH	0		19.3	7.83		0		0	0	0.001	0.001	5	0.36	380	550	0	510	0.8	0.8	0		0.32	220	7	80	667